Configuring SonicOS for Microsoft Azure

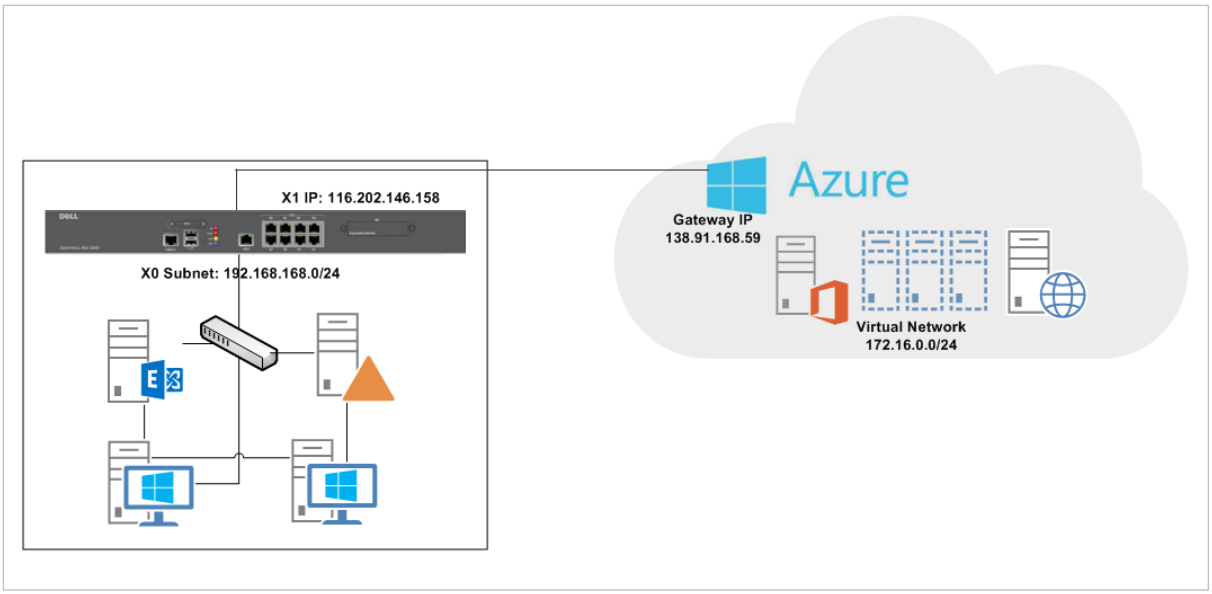
Configuration Guide

November 2015

Topics:

Purpose

This Configuration Guide details how to configure a policy-based or route-based VPN between Microsoft Azure and a Dell SonicWALL firewall running SonicOS. Azure is a cloud computing platform and infrastructure created by Microsoft. It is used for building, deploying, and managing applications and services through a global network of Microsoft managed datacenters. For SonicOS platforms, Azure provides site-to-site Virtual Private Network (VPN) connectivity between a Dell SonicWALL Next-Generation firewall and virtual networks hosted in the Azure cloud.



Deployment Considerations

Consider the following before deploying Microsoft Azure:

- The Azure Management Portal uses different terminology for VPNs than the SonicOS management interface, see the following for comparison:

VPN Terminology

Azure	SonicOS
Static Routing VPN	Site-to-Site VPN
Dynamic Routing VPN	Tunnel Interface VPN

- **Static Routing VPN** (Azure)/Site-to-Site VPN (SonicOS) are policy-based VPNs that allow users to specify a site-to-site network as part of a VPN policy, separate from a routing table lookup.
- **Dynamic Routing VPN** (Azure)/Tunnel Interface VPN (SonicOS) are route-based VPNs that can be used like an interface. This type of VPN can be configured with a route entry which is used to tunnel traffic as a part of the routing table lookup.

  NOTE: Currently, only static routes are available for use with SonicOS because Azure does not support dynamic routing protocols such as BGP, OSPF, or RIP.

- For authentication, only Pre-shared Key (PSK) is currently supported, certificate based site-to-site VPNs are not yet supported.

Supported Platforms

Microsoft Azure is supported with the following Dell SonicWALL appliances:

- SuperMassive E10000 Series
- SuperMassive 9200 / 9400 / 9600
- E-Class NSA E5500 / E6500 / E7500 / E8500 / E8510
- NSA 2600 / 3600 / 4600 / 5600 / 6600
- NSA 220 / 220W / 240 / 250M / 250MW / 2400 / 2400MX / 3500 / 4500 / 5000
- TZ 100 / 100W / 105 / 105W / 200 / 200W / 205 / 205W / 210 / 210W / 215 / 215W
- TZ 300 / 300W / 400 / 400W / 500 / 500W / 600

Supported firmware

For the SuperMassive E10000 series, all approved versions of SonicOS support Microsoft Azure.

For platforms other than the SuperMassive E10000 Series, the following SonicOS firmware or hotfixes support the latest version of Microsoft Azure:

Supported firmware and associated platforms

Firmware or hotfix	Platforms supported
6.2.4.3 (December 2015)	TZ 300/300W, 400/400W, 500/500W, 600
6.2.3.1-19n--HF163571-1n	
6.2.2.3-20n support build	NSA 2600/3600/4600/5600/6600, SuperMassive 9200/9400/9600
5.9.1.1_39o--HF157568_2o	E-Class NSA E5500 / E6500 / E7500 / E8500 / E8510 NSA 220/220W, 240, 250M/250MW, 2400, 2400MX, 3500, 4500, 5000 TZ 100/100W, 105/105W, 200/200W, 205/205W, 210/210W, 215/215W
5.9.1-39o--HF160565_3o	
5.8.1.15	

Contact Support at https://support.software.dell.com/manage-service-request to obtain a hotfix or support build for your Dell SonicWALL firewall. Non-hotfix or support build firmware is available on MySonicWALL for your platform.

Configuring a Policy-based VPN

To configure a policy-based VPN between the Dell SonicWALL firewall and Microsoft Azure, complete the following tasks on each side of the deployment (Azure and SonicOS), then test the connectivity between them:

- Azure Configuration Tasks
- SonicOS Configuration Tasks
- Testing the Connectivity

Azure Configuration Tasks

The following sections describe creating a virtual network in the Microsoft Azure Management Portal.

- Creating a Virtual Network
- Defining the SonicWALL Network
- Configuring a Virtual Network Address
- Creating a Virtual Network Gateway
- Managing Shared Keys

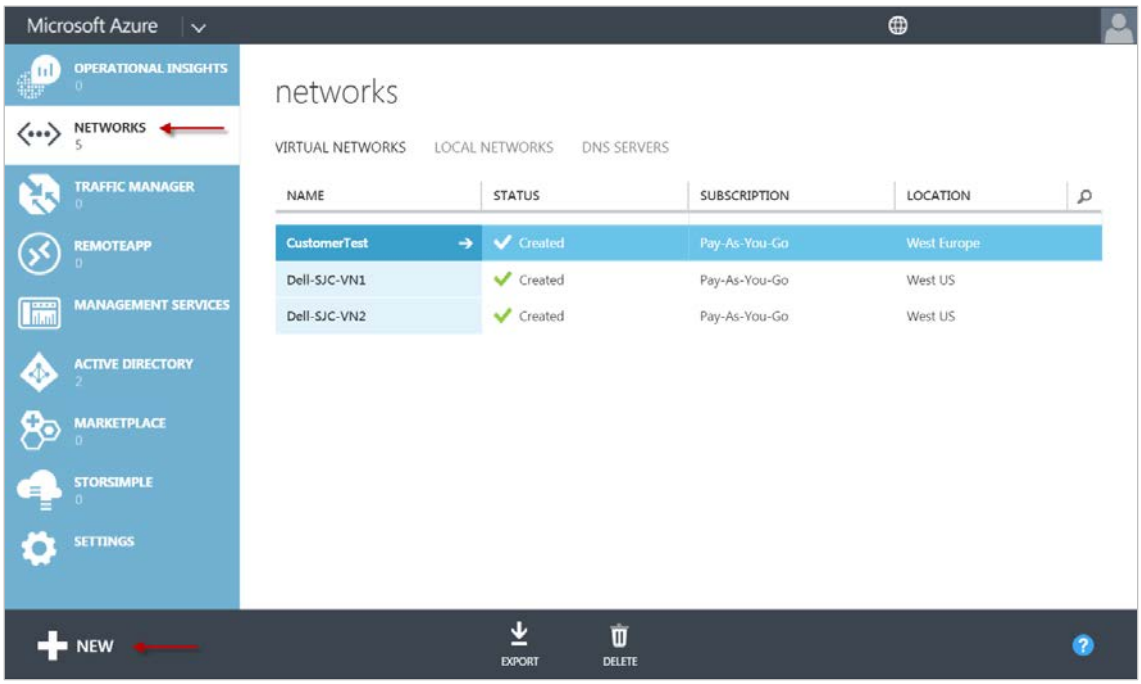
Creating a Virtual Network

To create a virtual network through the Microsoft Azure Management Portal, complete the following tasks:

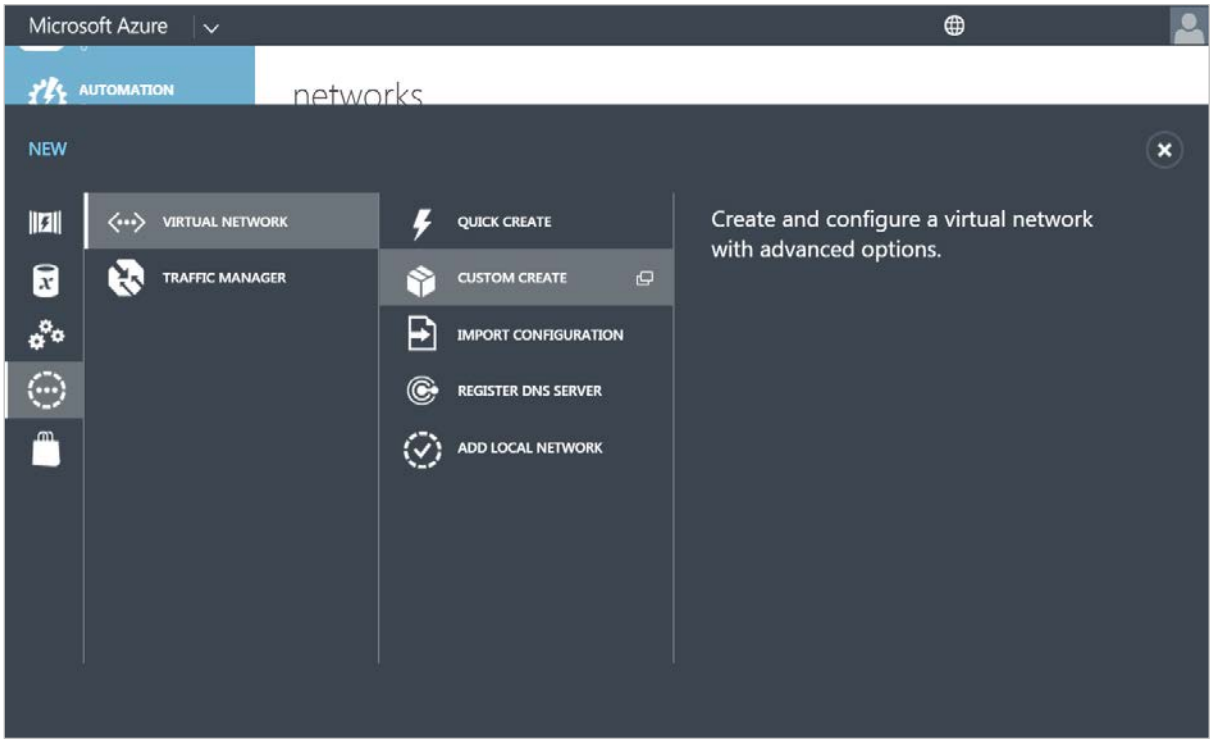
1 Log in to the Microsoft Azure Management Portal.

2 In the left navigation menu, click **NETWORKS**.

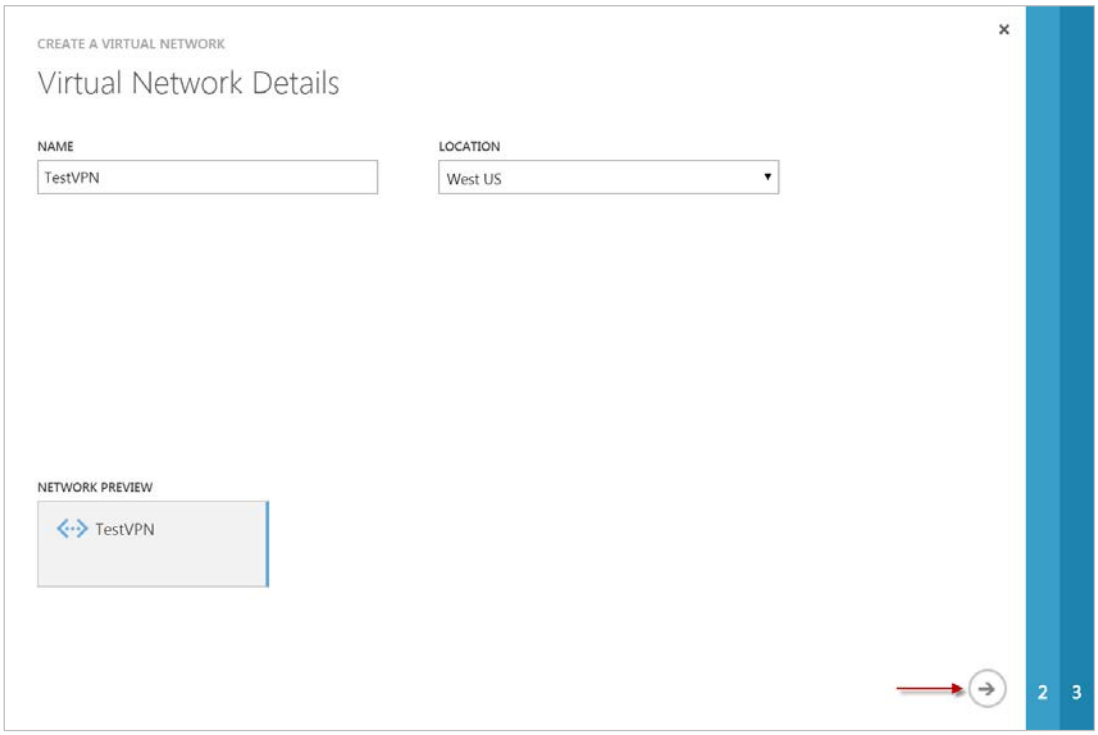
The Networks dialog displays and shows a list of available virtual networks.



3 Click **NETWORKS > VIRTUAL NETWORK > CUSTOM CREATE**.



The **CREATE A VIRTUAL NETWORK** wizard displays:



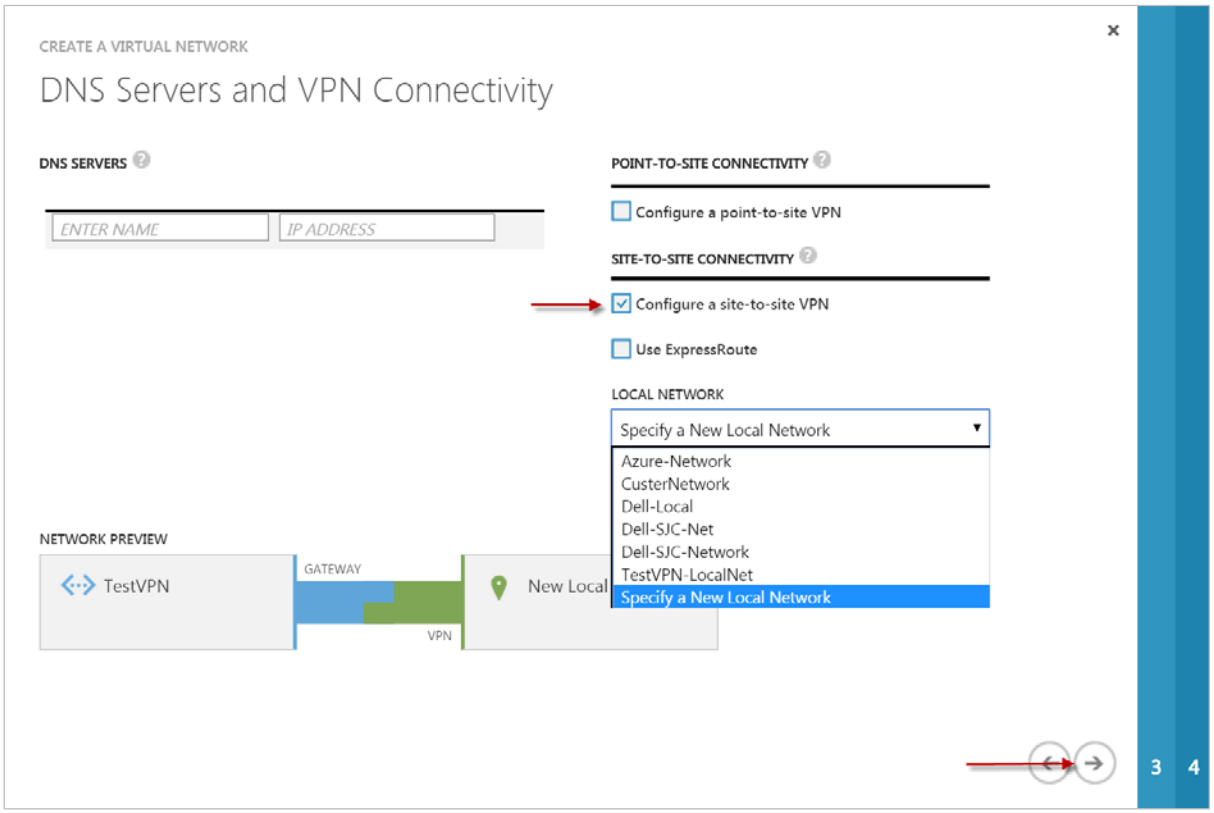
4 On the Virtual Network Details dialog, enter the following information:

- **NAME** – Name your virtual network. In this case, ***TestVPN***.
- **LOCATION** – Select a geographical location based on the options provided in the Azure portal.

5 Click the **Right Arrow** to continue to the next dialog.

Defining the SonicWALL Network

The **DNS Servers and VPN Connectivity** dialog displays. For more information about the settings on this dialog, refer to this MSN article on DNS Servers and VPN Connectivity.



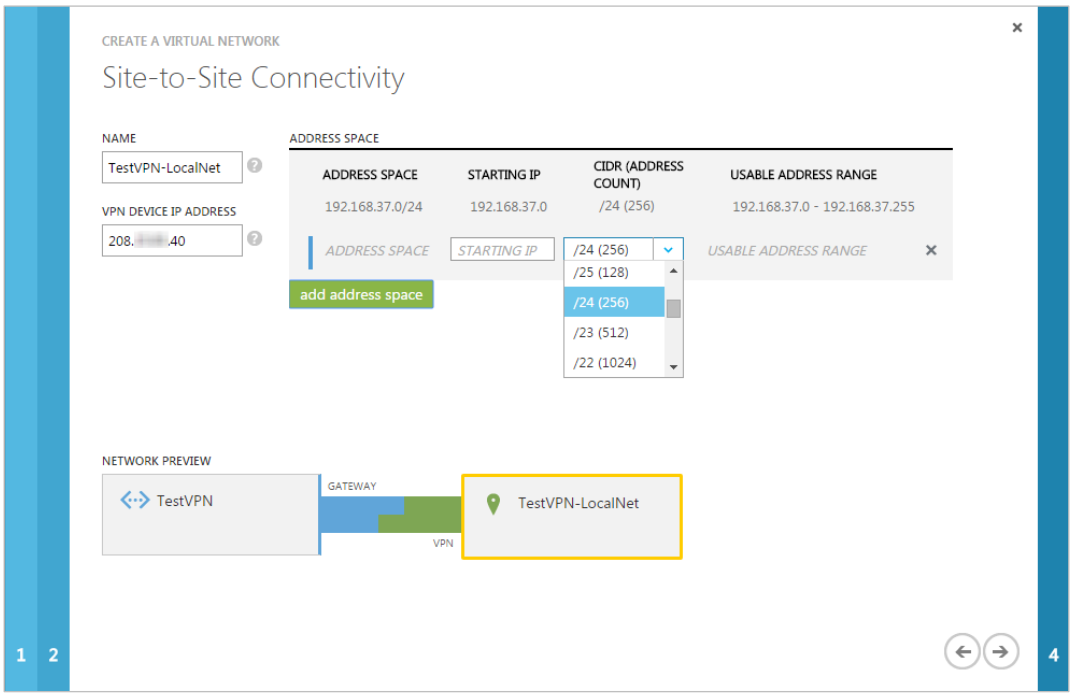
6 For **DNS SERVERS**, optionally fill in the **ENTER NAME** and **IP ADDRESS** fields. You can add DNS servers to your virtual network for name resolution. If you want to have name resolution between this virtual network and your on-premises network, you should specify the DNS servers that are used for your on-premises name resolution. You can also specify public DNS servers. If you do not specify a DNS server, name resolution is provided by Azure. The DNS server name and IP address entries are omitted for the purpose of this Configuration Guide.

7 Click **Configure a site-to-site VPN**.

8 Click the **LOCAL NETWORK** drop-down menu and either select a network (if it has been created already) or select **Specify a New Local Network**. The local network here is the network behind the Dell SonicWALL firewall.

9 Click the **right arrow** to proceed to the next dialog.

The **Site-to-Site Connectivity** dialog displays:



10 Enter the following information:

- **NAME** – Enter a name for your local network. This is the friendly name the Azure Virtual Network uses to refer to your on-premises local network. Entering a name does not configure any settings on your on-premises network.
- **VPN DEVICE IP ADDRESS** – This is the WAN IPv4 address of the Dell SonicWALL firewall. Enter the IP address of your local firewall. After you complete the Azure network configurations, you can configure your local firewall.

NOTE: The IP address of this firewall must be public-facing and cannot be located behind an NAT device.

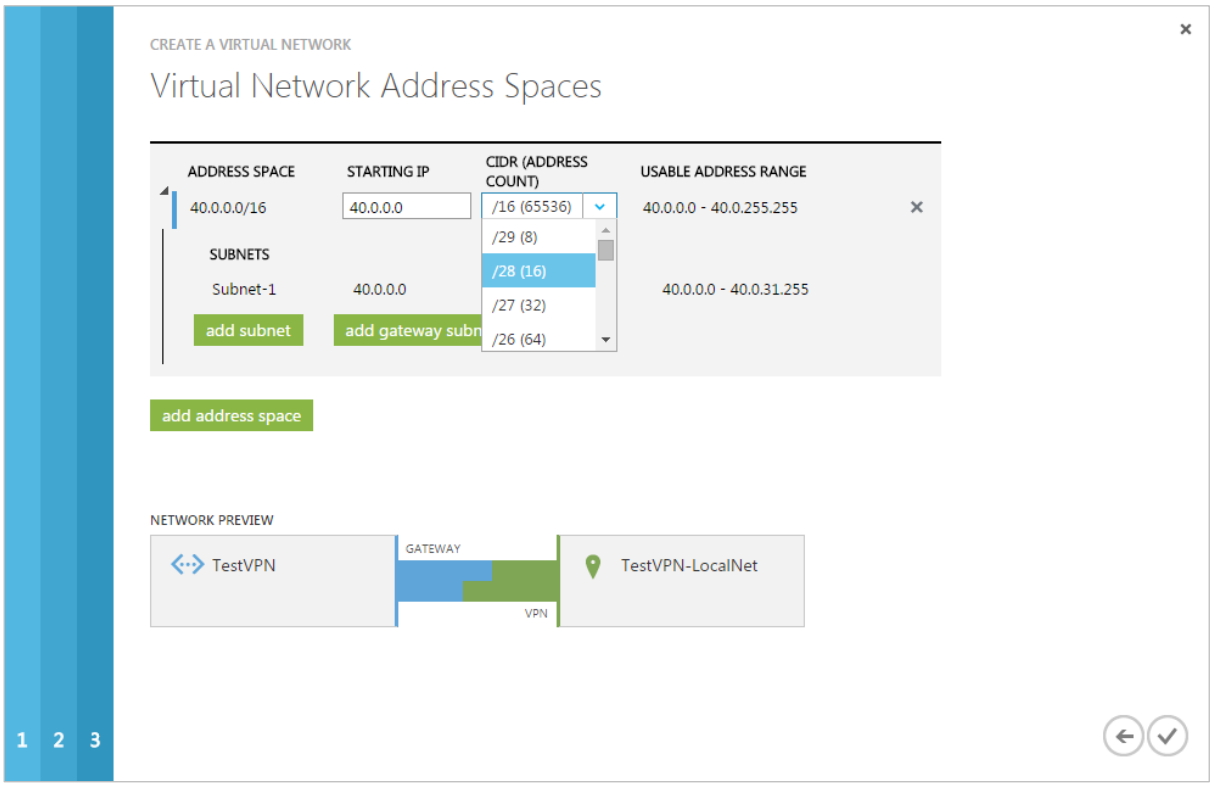
11 Click **add address space** to add additional networks behind the Dell SonicWALL firewall. The **ADDRESS SPACE** (including **STARTING IP** and **CIDR**) is the internal network behind the Dell SonicWALL firewall. For more information about the settings on this dialog, refer to this MSN article on Site-To-Site Connectivity.

12 Click the **right arrow** to proceed to the next dialog.

Configuring a Virtual Network Address

For more information about the settings on this dialog, refer to this MSN article titled About Configuring a Virtual Network using the Management Portal.

After clicking the right arrow to the fourth dialog, the **Virtual Network Address Spaces** dialog displays:



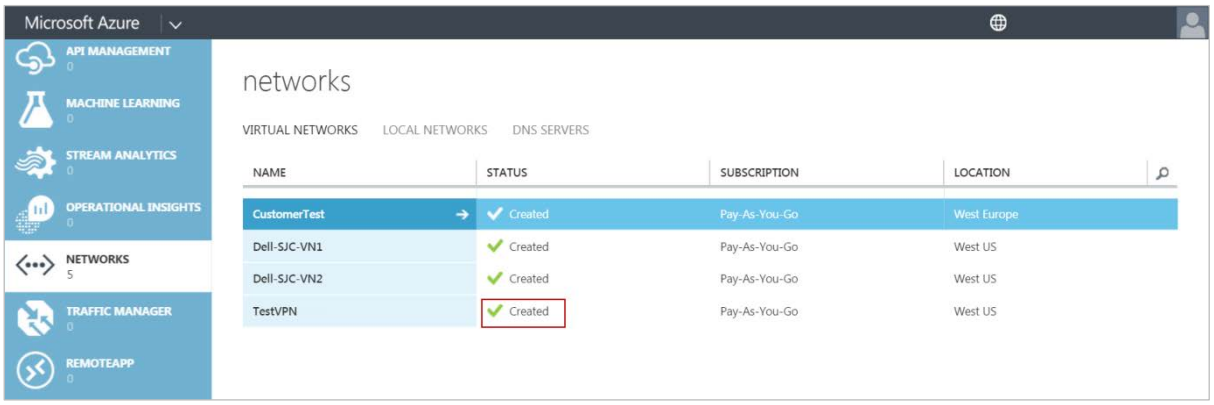
13 Click the **STARTING IP** drop-down menu, and then enter the network ID (private address range).

14 Click the **CIDR** drop-down menu, and then select the desired subnet bits.

15 Click **add gateway subnet**. The Gateway IP address is automatically populated based on the address space entered previously. Microsoft runs a gateway service to enable cross-premises connectivity. To this end, two IP addresses are required from the virtual network to enable routing between the physical premises and the cloud. A subnet with at least 29 bits in the routing prefix (/29 in CIDR notation) must be specified from which you can pick IP addresses for setting up routes.

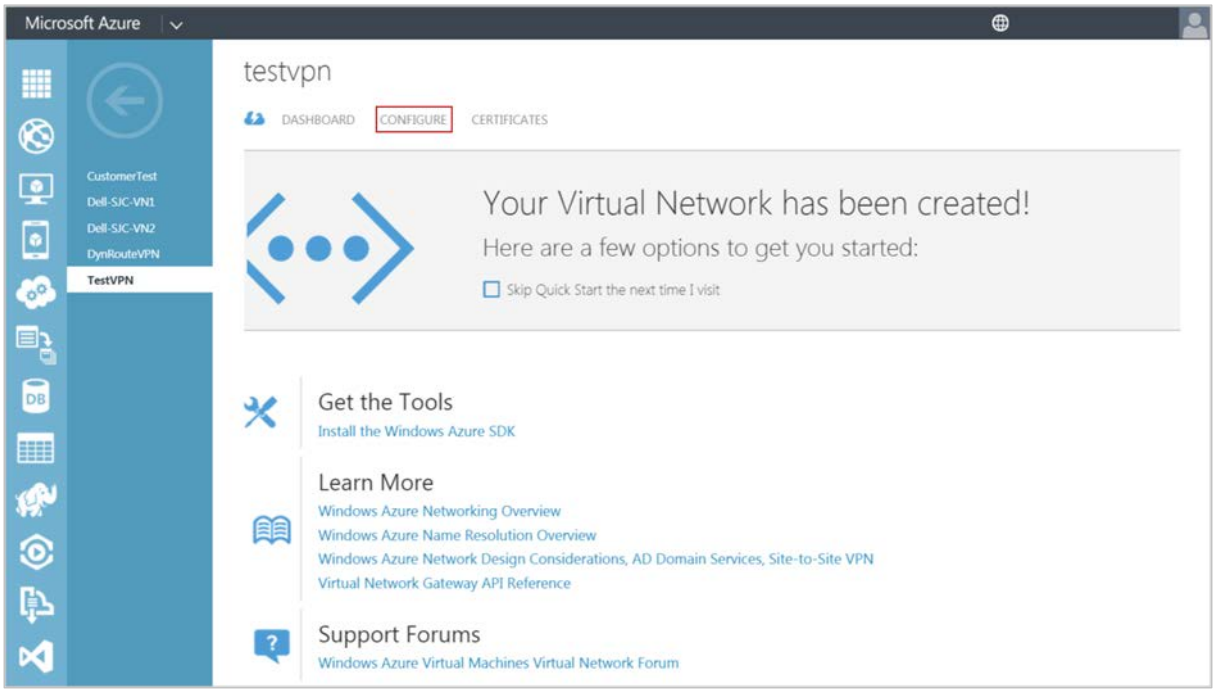
16 Click the **Checkmark** to create your network.

After your virtual network is created, the **Management Portal > NETWORKS** dialog displays the **STATUS** as ***Created***:

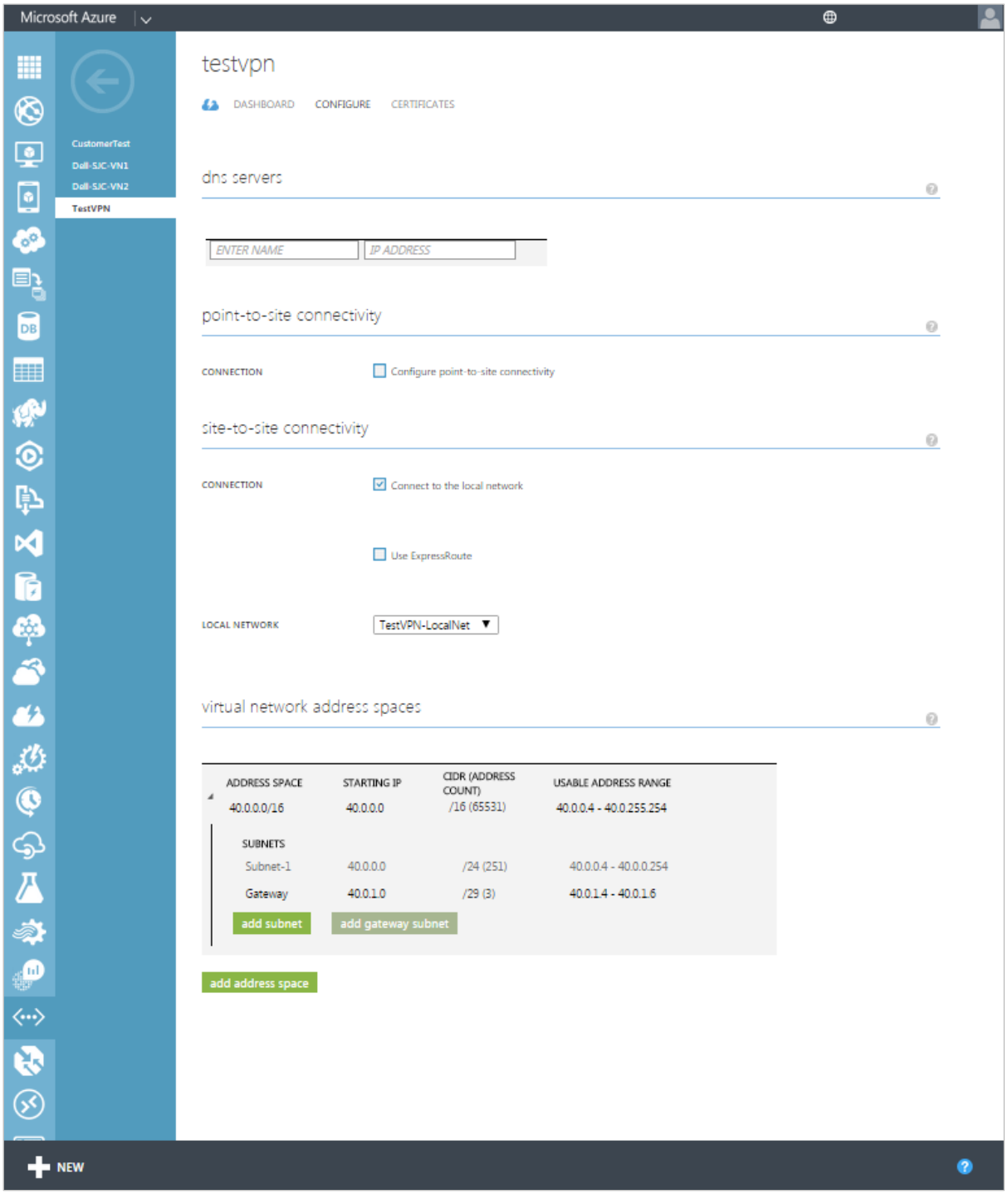


At this point in the configuration, a virtual network is created in the cloud and a remote network is specified (the Dell SonicWALL network).

17 To view the configuration details, click the name of the virtual network (in this case ***TestVPN***) in the NAME column.



18 On the **TestVPN Quick Start** dialog, click **CONFIGURE** to view the details. The **TestVPN Configuration** dialog appears.

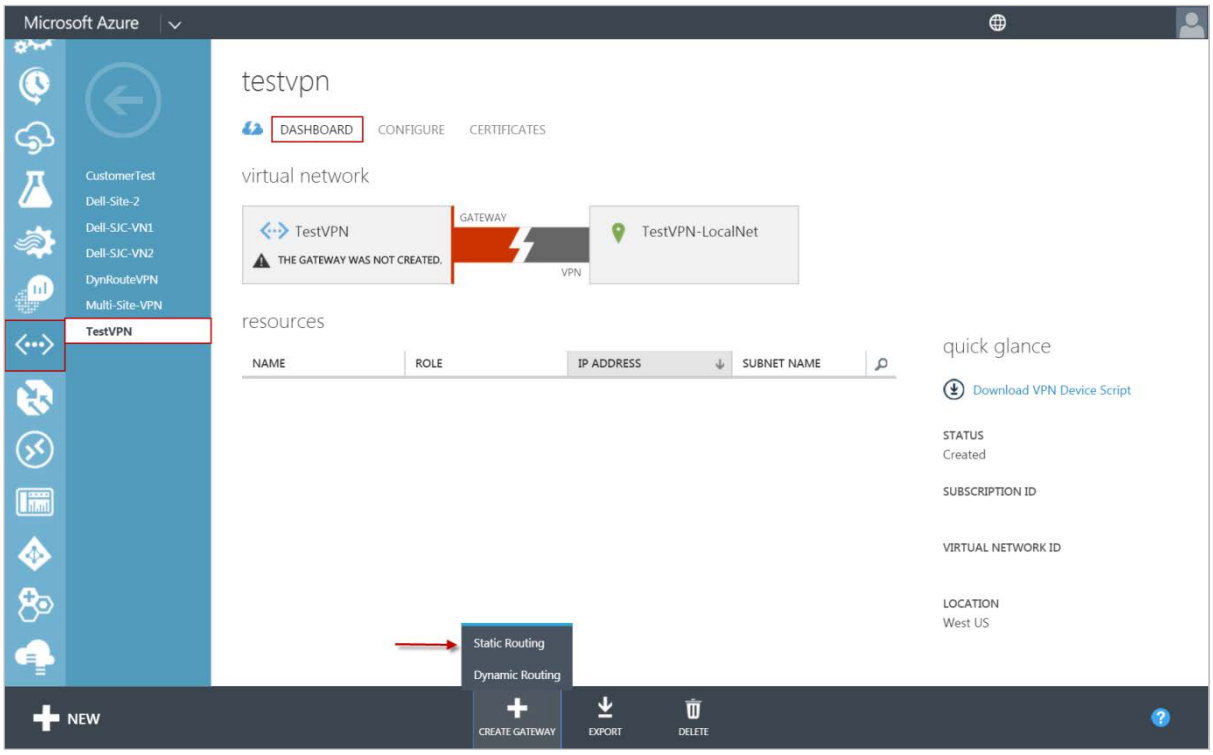


19 Add additional subnets and DNS servers as necessary.

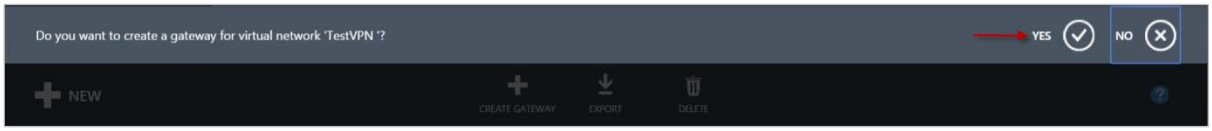
Creating a Virtual Network Gateway

20 On the **TestVPN Quick Start** dialog, click **DASHBOARD**.

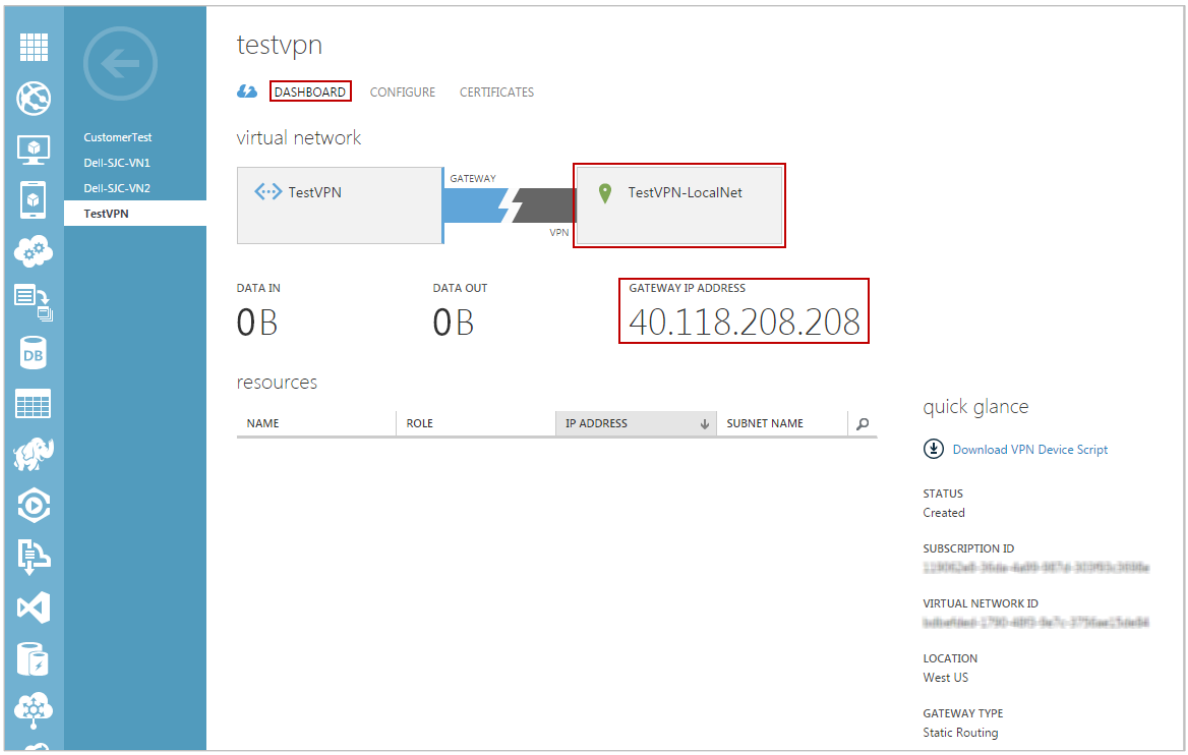
At the bottom of the dialog, click **CREATE GATEWAY**, and then select **Static Routing**.



21 When prompted to confirm the gateway creation, click **YES**. Depending on your connection, it could take up to 15 minutes to create the gateway.



The updated TestVPN Quick Start dialog displays:



The public facing IPv4 address is not generated until the gateway has been created. After the gateway is created, you should see the public facing IPv4 address of your virtual network under the **GATEWAY IP ADDRESS**. This IP address must be entered under **the VPN > Settings | VPN Policies Configure - IPsec Primary Gateway Name or Address** option in the Dell SonicWALL firewall.

IMPORTANT: The GATEWAY IP ADDRESS might change if the gateway is deleted and re-created.

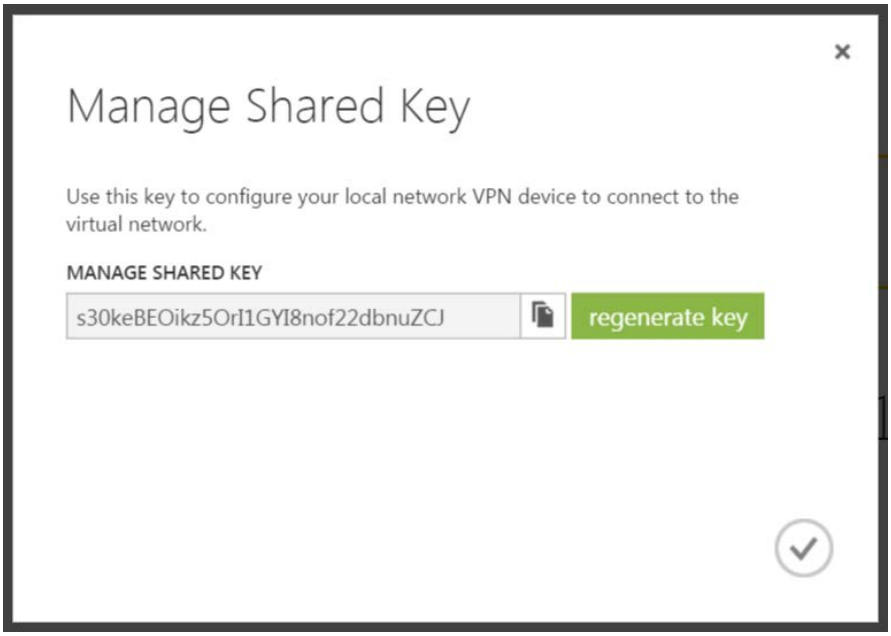
Managing Shared Keys

Use Shared Keys to configure your Dell SonicWALL firewall to connect to the Azure virtual network.

To obtain a Shared Key, complete the following steps:

22 Click **MANAGE KEY** at the bottom of the Azure Dashboard.

A pop-up dialog appears. This dialog includes an auto-generated shared key you can copy to connect the Microsoft Azure gateway and your Dell SonicWALL firewall.



23 Click the Copy icon next to the key to copy the shared key.

You can optionally click **regenerate key** should you decide to change the VPN preshared secret in the future.

CAUTION: If you regenerate the key after using it to connect the firewall and the virtual network, the virtual network will lose connectivity with the local network until you reconfigure the firewall with the new key.

SonicOS Configuration Tasks

Use the SonicOS management interface of your Dell SonicWALL appliance to complete the following tasks:

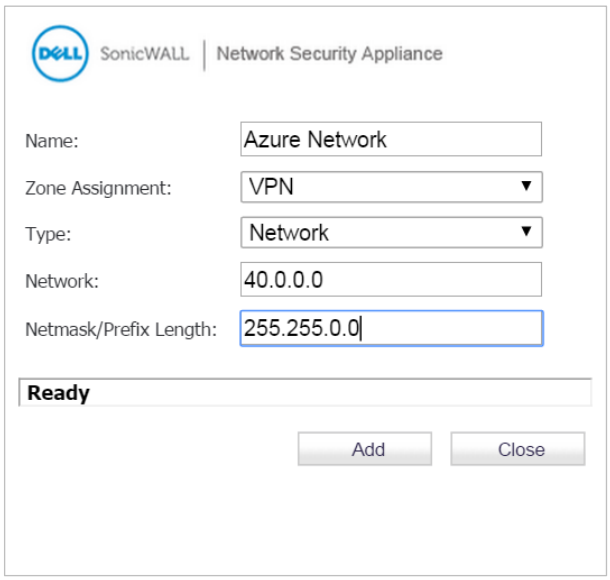
- Creating an Address Object for the Virtual Network
- Creating a Policy-Based VPN

Creating an Address Object for the Virtual Network

1 Navigate to the **Network > Address Objects** dialog.

2 Click **Add...** to create a new Address Object.

The **Add Address Object** dialog displays:



NOTE: The information displayed in this dialog is for example only, and can vary depending on your network.

3 Enter the following information:

- **Name** – Enter a name for the Address Object (***Azure Network*** is used in this example)
- **Zone Assignment** – Click the drop-down, and then select **VPN**.
- **Type** – Click the drop-down, and then select **Network**.
- **Network** – Enter the network IP address as shown in the TestVPN Quick Start dialog.
- **Netmask/Prefix Length** – Enter the netmask.

4 Click **Add**.

Creating a Policy-Based VPN

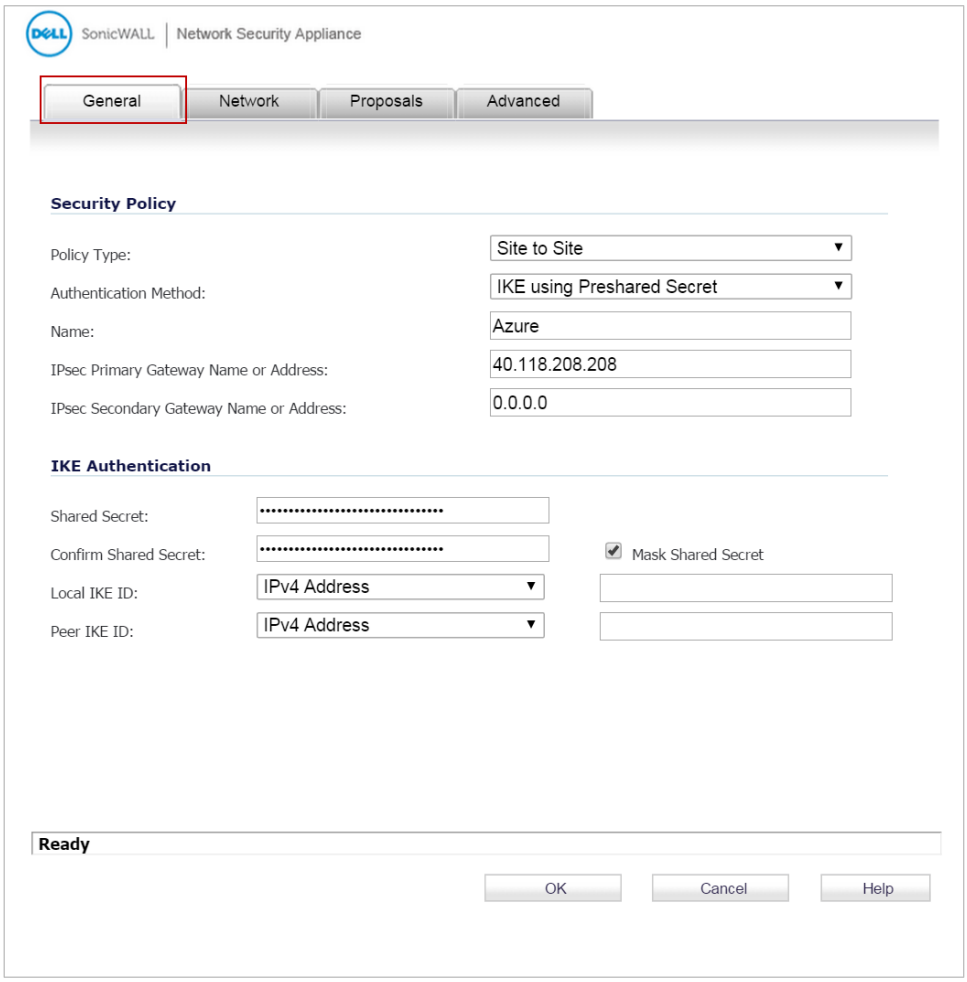
To create a Policy-based VPN on the firewall:

5 Log in to the SonicOS management interface as an administrator.

6 Navigate to the **VPN > Settings** dialog.

7 Click **Add**.

The **VPN Policy** dialog displays:



8 Enter the following information:

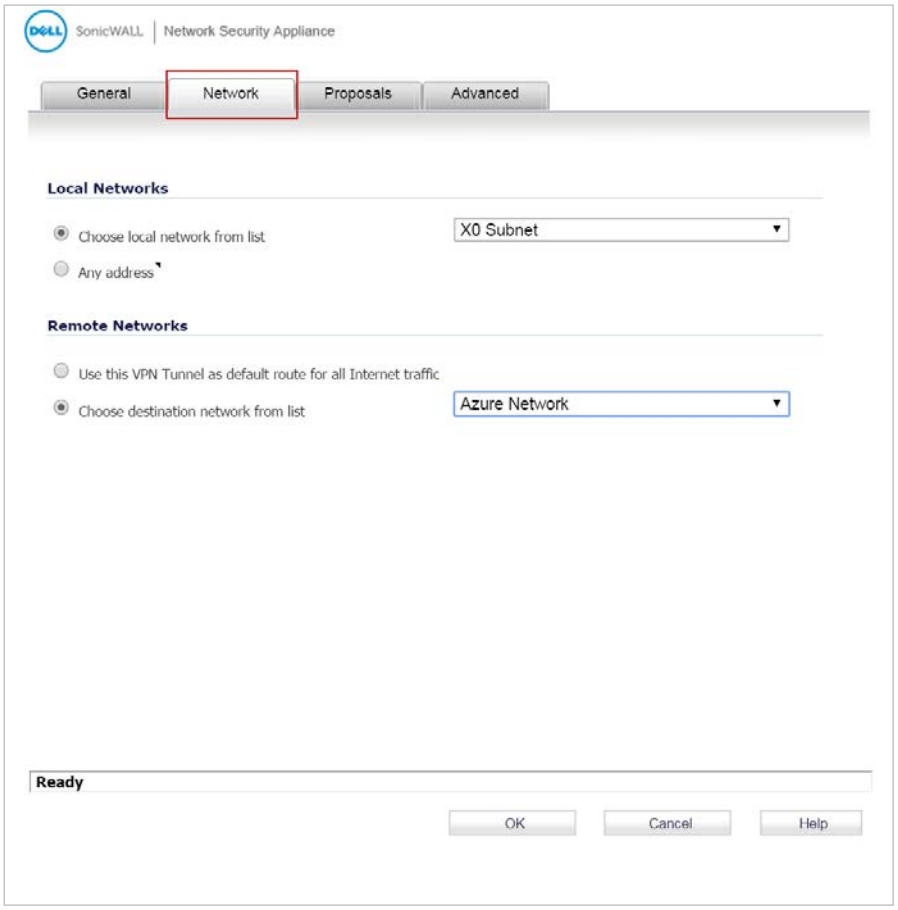
- **Policy Type** – Select **Site to Site** from the drop-down menu.
- **Authentication Method** – select the **IKE using Preshared Secret** authentication method.
- **Name** – Enter a name for the policy (this example uses ***Azure***).
- **IPsec Primary Gateway Name or Address** – Enter the **GATEWAY IP ADDRESS** displayed on the **Virtual Network TestVPN Dashboard** dialog of the Azure Management Portal. Refer to the Creating a Virtual Network Gateway section.
- **Shared Secret** – This is auto-generated by Azure. Copy it from the Azure Virtual Network dashboard, under **Manage Key**, and then enter it into this field. For more information, see Managing Shared Keys.

9 Click the **Network** tab.

10 Click the **Choose local network from list** radio button, and then select the desired local network (This could vary depending on your network. The **X0 Subnet** is used in this example).

> **NOTE:** This needs to be the same local network that was previously entered in the Azure Management Portal under the **Starting IP** text-field. Refer to Defining the SonicWALL Network to obtain this IP address.

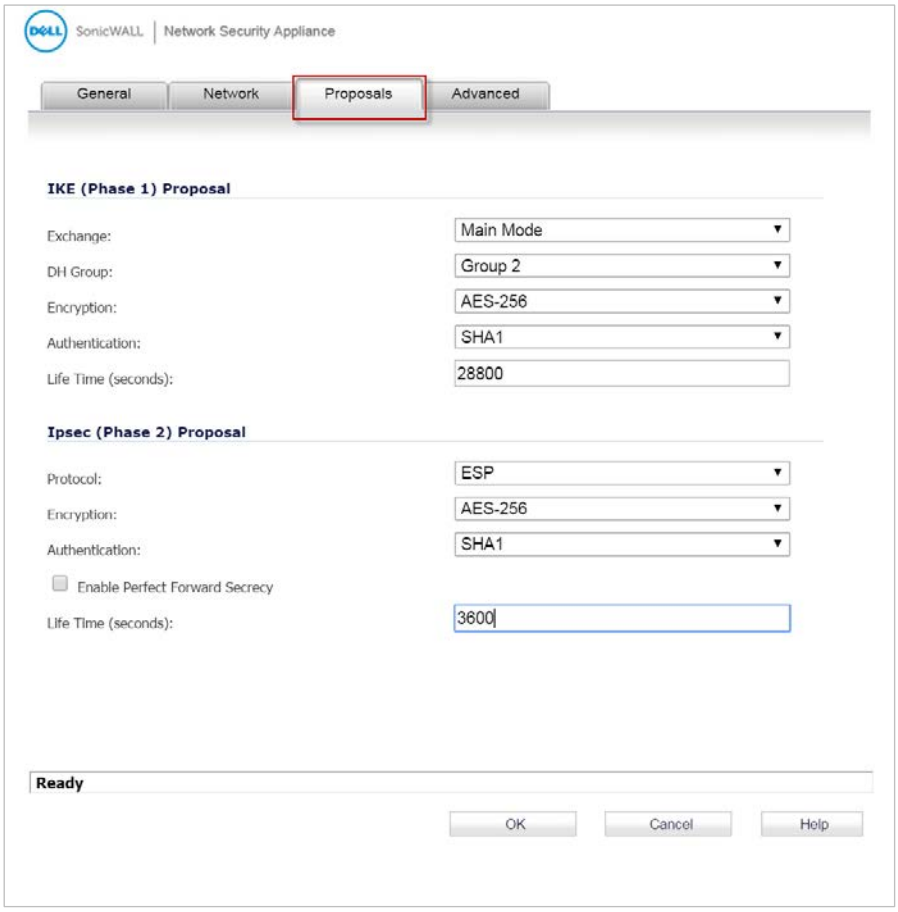
11 Click **Choose destination network from list**, and then select the desired address object name, ***Azure Network*** in this example, from the drop-down menu.



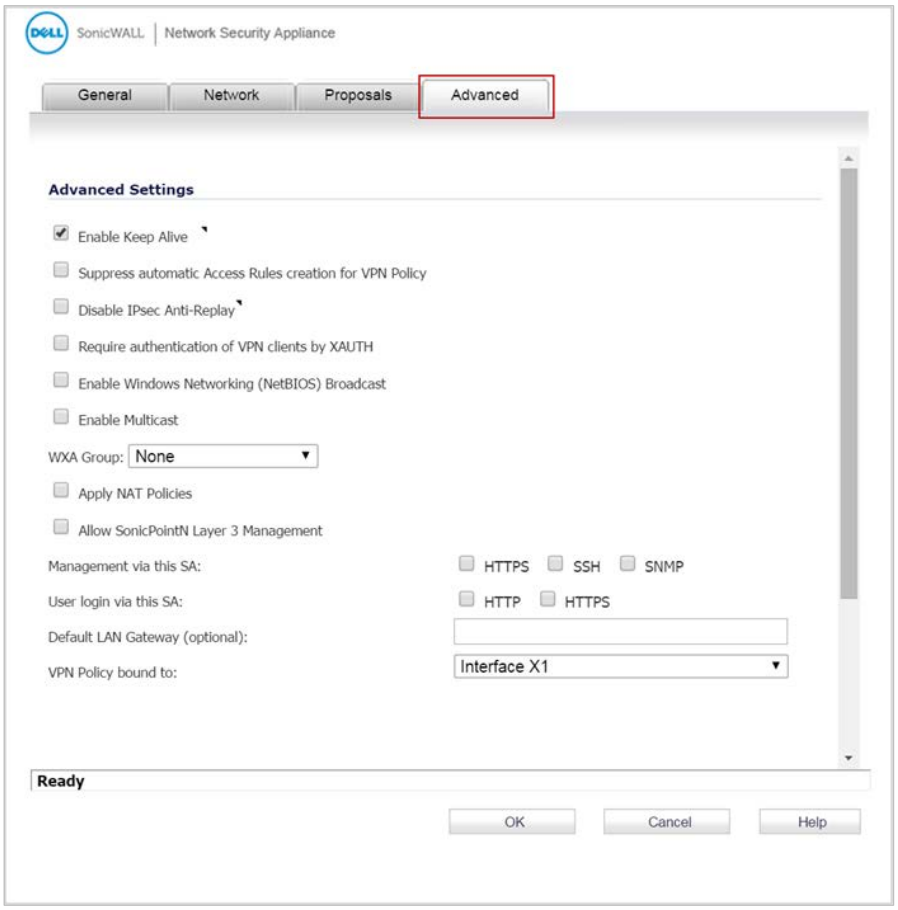
12 Click the **Proposals** tab.

13 Click the **Exchange** drop-down menu, and then select **Main Mode**.

Azure supports only Main Mode for static-routing site to site VPN. For more information about the Proposals supported in Azure, see the MSN article About VPN Devices for Virtual Network.



14 Click the **Advanced** tab.



15 Select **Enable Keep Alive** to use heartbeat messages between peers on this VPN tunnel. If one end of the tunnel fails, using Keepalives allows for the automatic renegotiation of the tunnel without having to wait for the proposed Life Time to expire.

16 Click the **VPN Policy bound to** drop-down menu, and then select the appropriate interface (the WAN interface on the Dell SonicWALL firewall). For example: Interface X1.

17 Click **OK**.

Testing the Connectivity

The SonicWALL firewall automatically initiates the VPN connection and keeps it alive when **Keep Alive** is enabled.

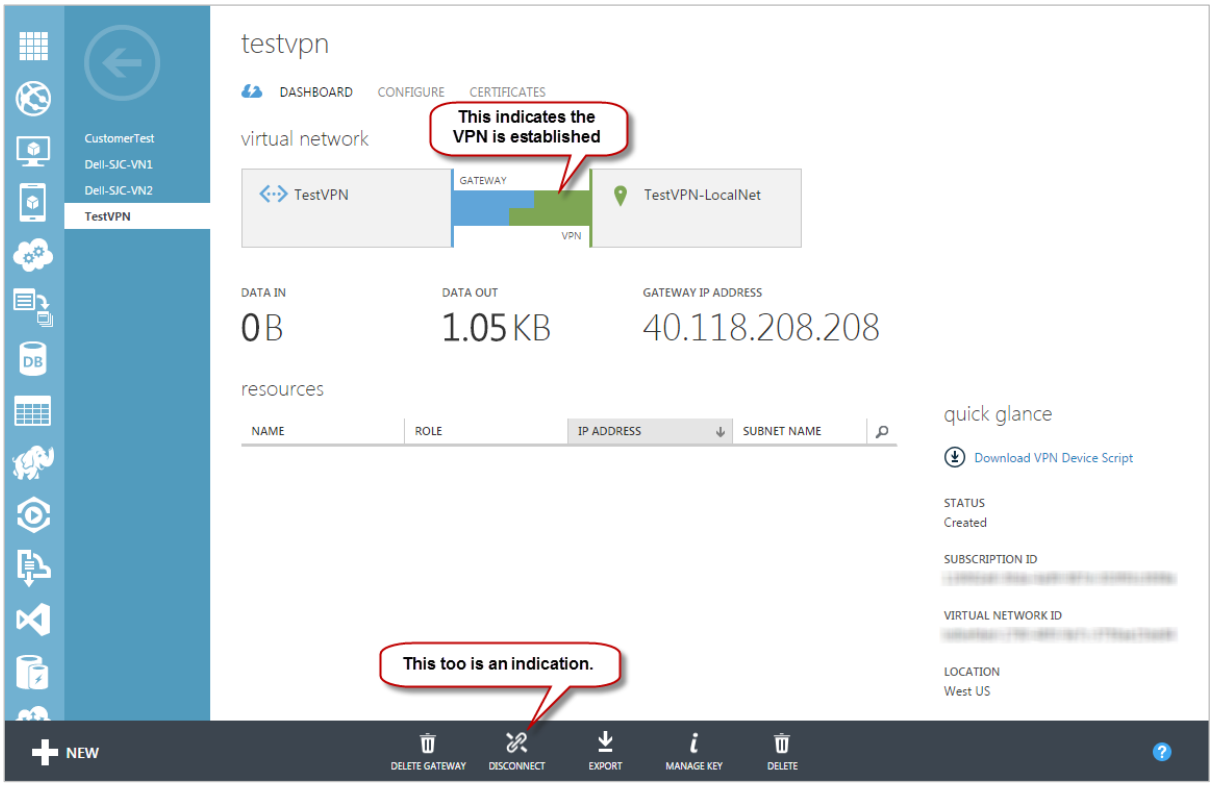
To test the connectivity from Azure:

1 Go to the Azure Management Portal, and navigate to **Networks**.

2 Click the virtual network and go to its **Dashboard** dialog.

3 Click **CONNECT** to initiate the VPN connection from the Azure gateway.

After a brief wait, the VPN tunnel shows as connected in the Azure Management Portal. After the tunnel is established, the portal appears as follows:



To test traffic flow from the Dell SonicWALL side to the Azure cloud, complete either of the following:

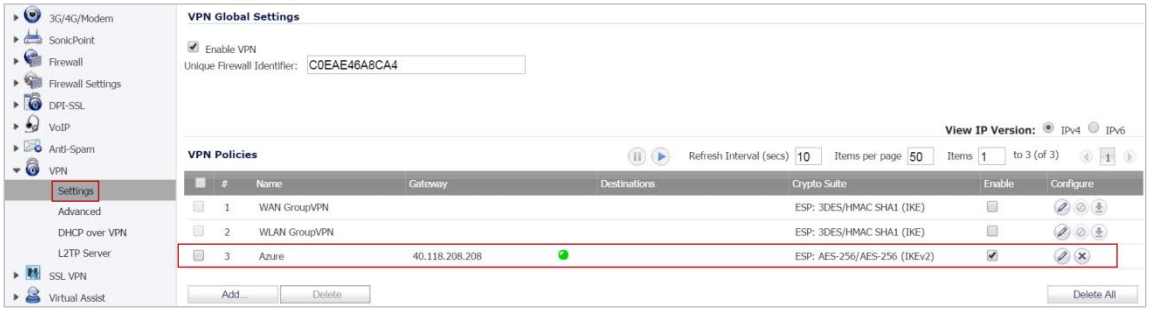
- Try to establish an RDP connection to a VM in the cloud on port 3389 from a host behind the Dell SonicWALL firewall.
- Try to ping a VM in the cloud from a host behind the Dell SonicWALL firewall.

> **NOTE:** By default, a Virtual Machine (VM) in the Azure cloud has inbound ICMP blocked by the Windows firewall and needs to be enabled using this command: *`netsh advfirewall firewall add rule name="All ICMP V4" protocol=icmpv4:any,any dir=in action=allow`*

To test the connectivity from SonicOS:

1 Log in to the SonicOS management interface, and navigate to the **VPN > Settings** dialog.

In the **VPN Policies** table, the VPN shows as connected:



Configuring a Route-based VPN

To configure a route-based VPN between the Dell SonicWALL firewall and Microsoft Azure, complete the following tasks on each side of the deployment (Azure and SonicOS), then test the connectivity between them:

- Azure Configuration Tasks
- SonicOS Configuration Tasks
- Testing the Connectivity

Azure Configuration Tasks

The following sections describe creating a virtual network in the Microsoft Azure Management Portal:

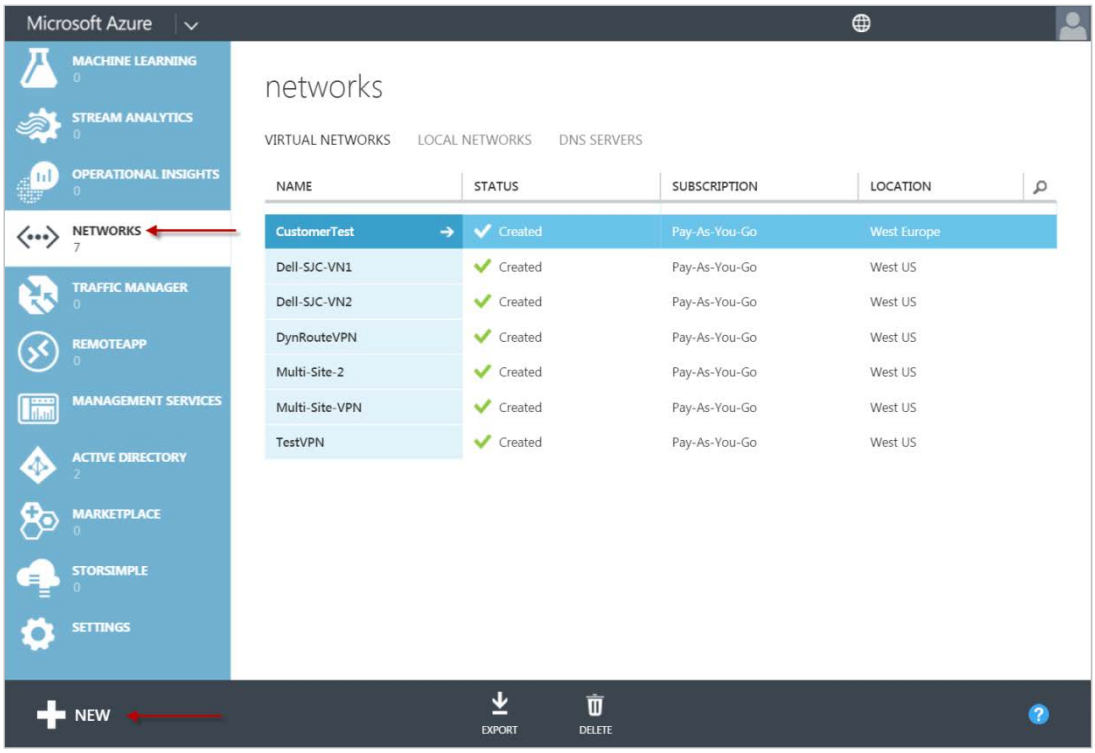
- Creating a Virtual Network
- Defining the SonicWALL Network
- Configuring a Virtual Network Address
- Creating a Virtual Network Gateway
- Managing Shared Keys

Creating a Virtual Network

To create a virtual network through the Microsoft Azure Management Portal:

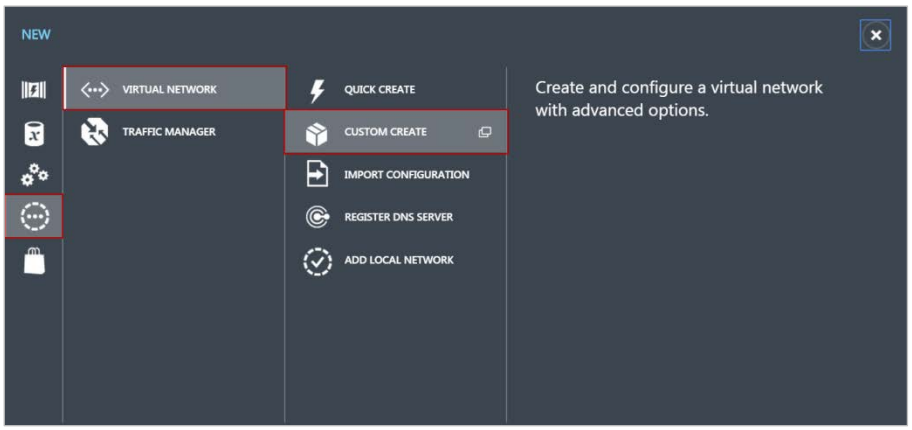
1 Log in to the Microsoft Azure Management Portal.

2 In the left navigation menu, click **NETWORKS** to show a list of available networks:

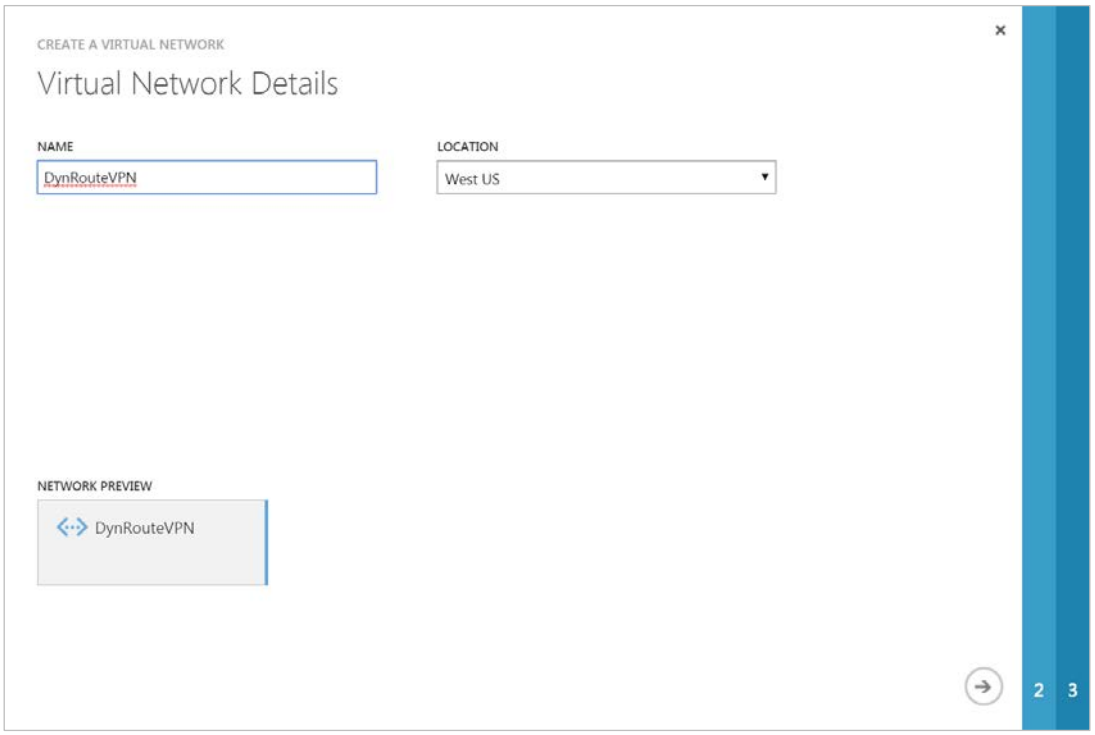


3 In the bottom left corner of the dialog, click **NEW**.

4 Click **NETWORKS > VIRTUAL NETWORK > CUSTOM CREATE**.



The **Create a Virtual Network** wizard displays:



5 On the Virtual Network Details dialog, enter the following information:

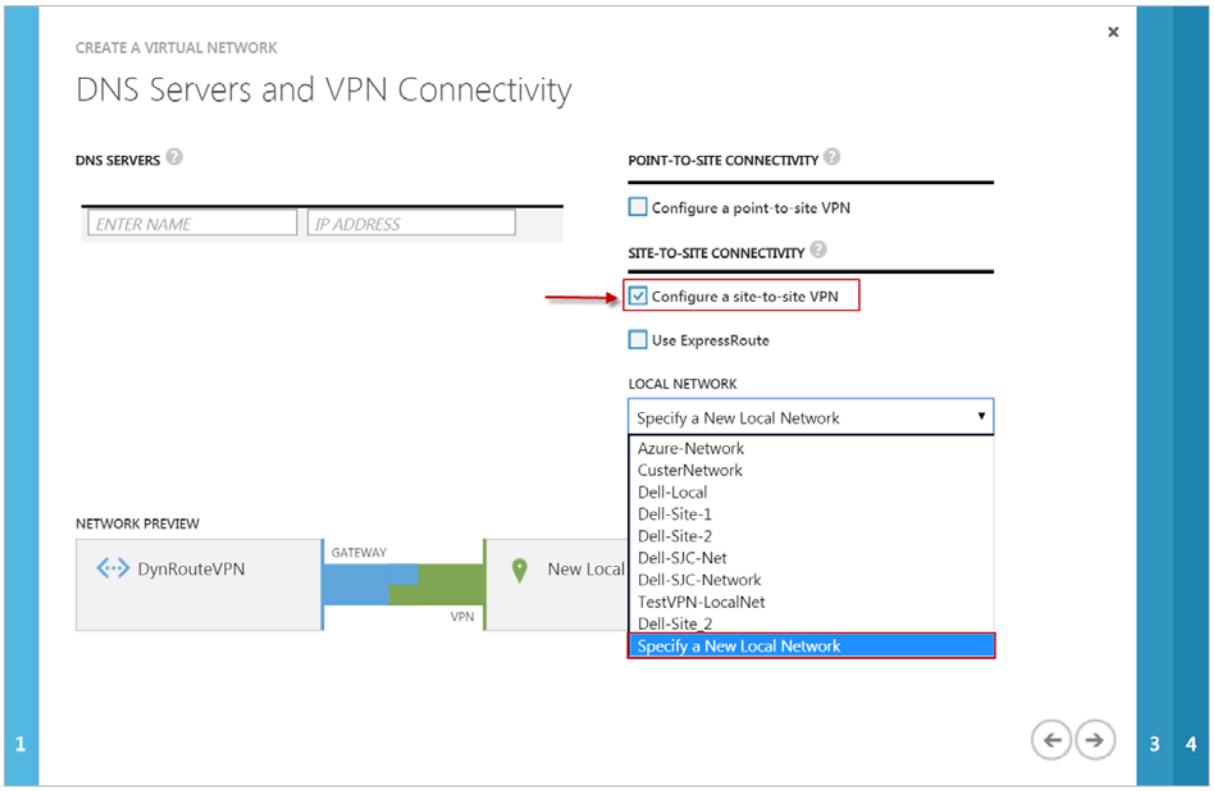
- **NAME** – Name your virtual network. In this case, ***DynRouteVPN***.
- **LOCATION** – Select a geographical location based on the options provided in the Azure portal.

6 Click the **right arrow** to continue to the next dialog.

Defining the SonicWALL Network

For more information about the settings on this dialog, refer to this MSN article on DNS Servers and VPN Connectivity.

The **DNS Servers and VPN Connectivity** dialog displays:



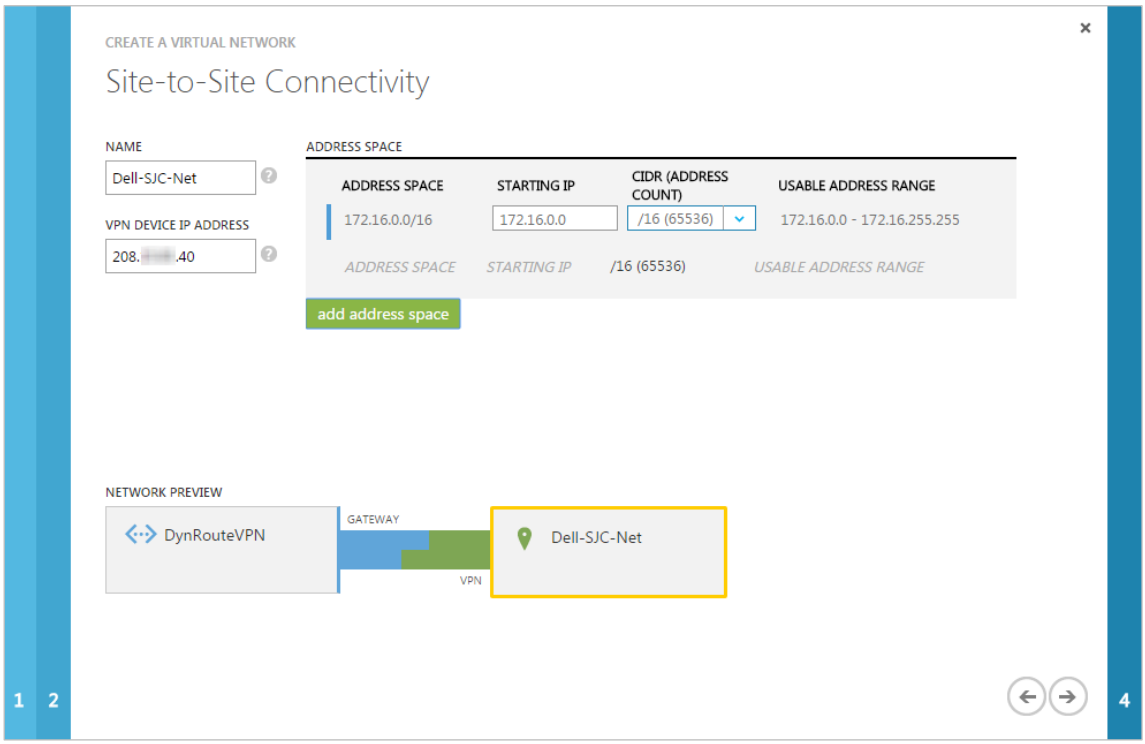
7 For **DNS SERVERS**, optionally fill in the **ENTER NAME** and **IP ADDRESS** fields. You can add DNS servers to your virtual network for name resolution. If you want to have name resolution between this virtual network and your on-premises network, you should specify the DNS servers that are used for your on-premises name resolution. You can also specify public DNS servers. If you do not specify a DNS server, name resolution is provided by Azure. The DNS server name and IP address entries are omitted for the purpose of this Configuration Guide.

8 Click **Configure site-to-site VPN**.

9 Click the **LOCAL NETWORK** drop-down menu and either select a network (if it has been created already) or select **Specify a New Local Network**. The Local network would be the network behind the Dell SonicWALL firewall.

10 Click the **right arrow** to proceed to the next dialog.

The **Site-to-Site Connectivity** dialog displays:



11 Enter the following information:

- **NAME** – Enter a name for your local network. This is the friendly name the Azure Virtual Network uses to refer to your on-premises local network. Entering a name does not configure any settings on your on-premises network.
- **VPN DEVICE IP ADDRESS** – This is the WAN IPv4 address of the Dell SonicWALL firewall. Enter the IP address of your local firewall. After you complete the Azure network configurations, you can configure your local firewall.

> **NOTE:** The IP address of this firewall must be public-facing and cannot be located behind an NAT device.

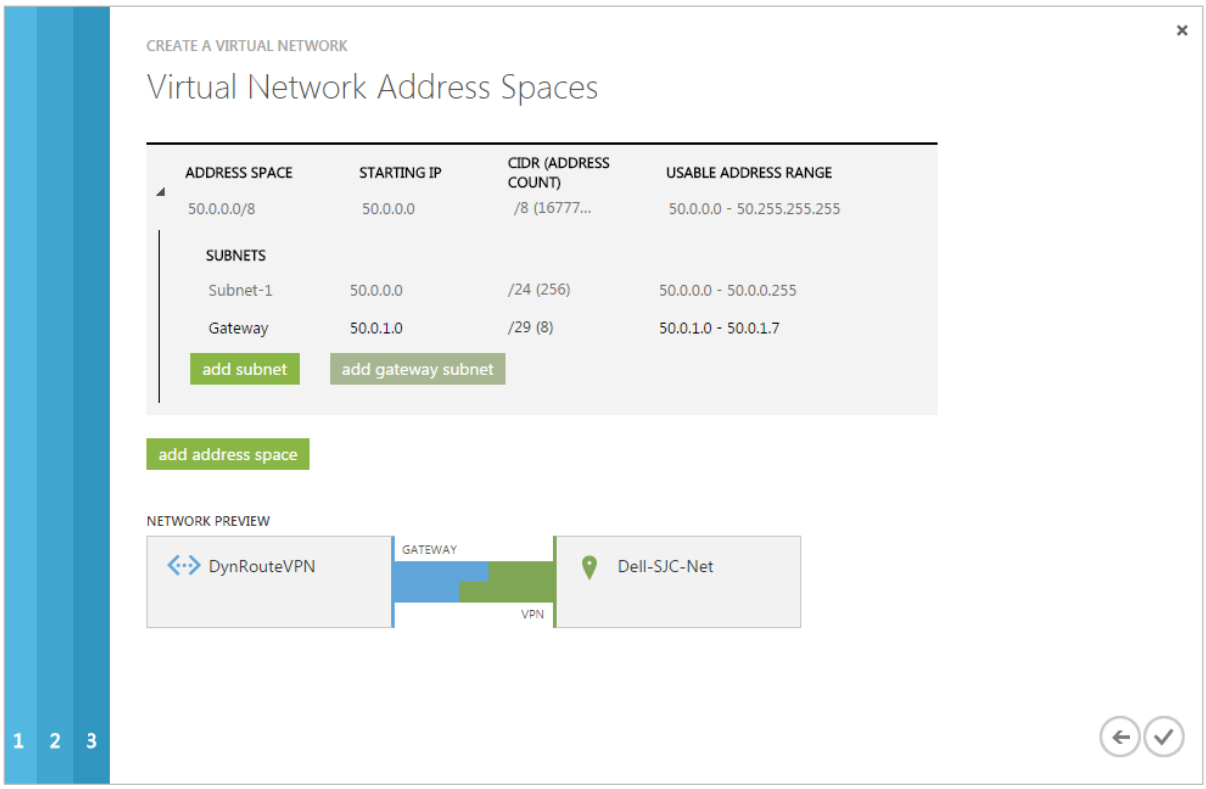
12 Click **add address space** to add additional networks behind the Dell SonicWALL firewall. The ADDRESS SPACE (including STARTING IP and CIDR) is the internal network behind the Dell SonicWALL firewall. For more information about the settings on this dialog, refer to this MSN article on Site-To-Site Connectivity.

13 Click the **right arrow** to proceed to the next dialog.

Configuring a Virtual Network Address

For more information about the settings on this dialog, refer to this MSN article titled About Configuring a Virtual Network using the Management Portal.

The **Virtual Network Address Spaces** dialog displays showing the protected network behind the Azure virtual gateway:



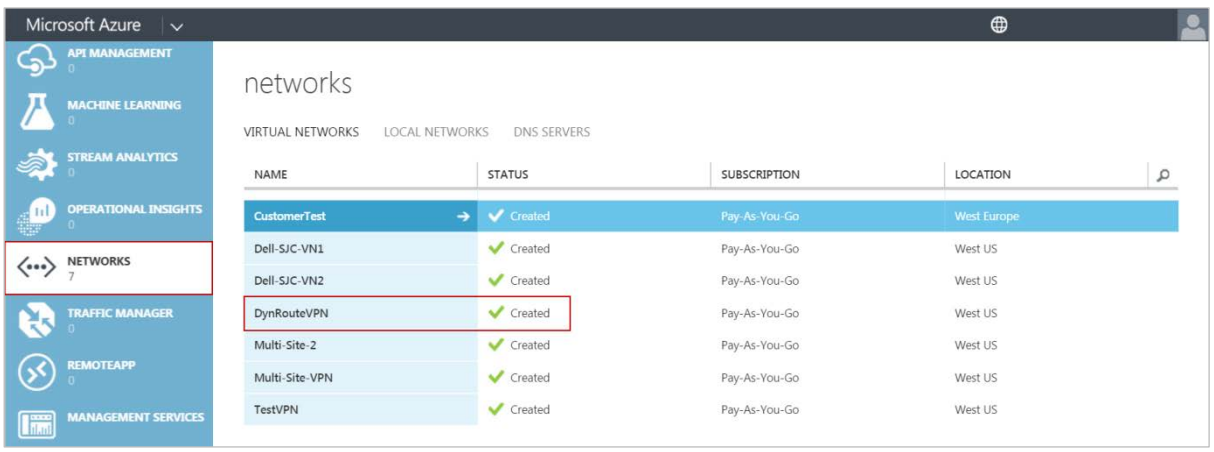
14 Click the **STARTING IP** drop-down menu, and then enter the network ID (private address range).

15 Click the **CIDR** drop-down menu, and then select the desired subnet bit.

16 Click **add gateway subnet**. The Gateway IP address is automatically populated based on the address space entered previously. Microsoft runs a gateway service to enable cross-premises connectivity. To this end, two IP addresses are required from the virtual network to enable routing between the physical premises and the cloud. A subnet with at least 29 bits in the routing prefix (/29 in CIDR notation) must be specified from which you can pick IP addresses for setting up routes.

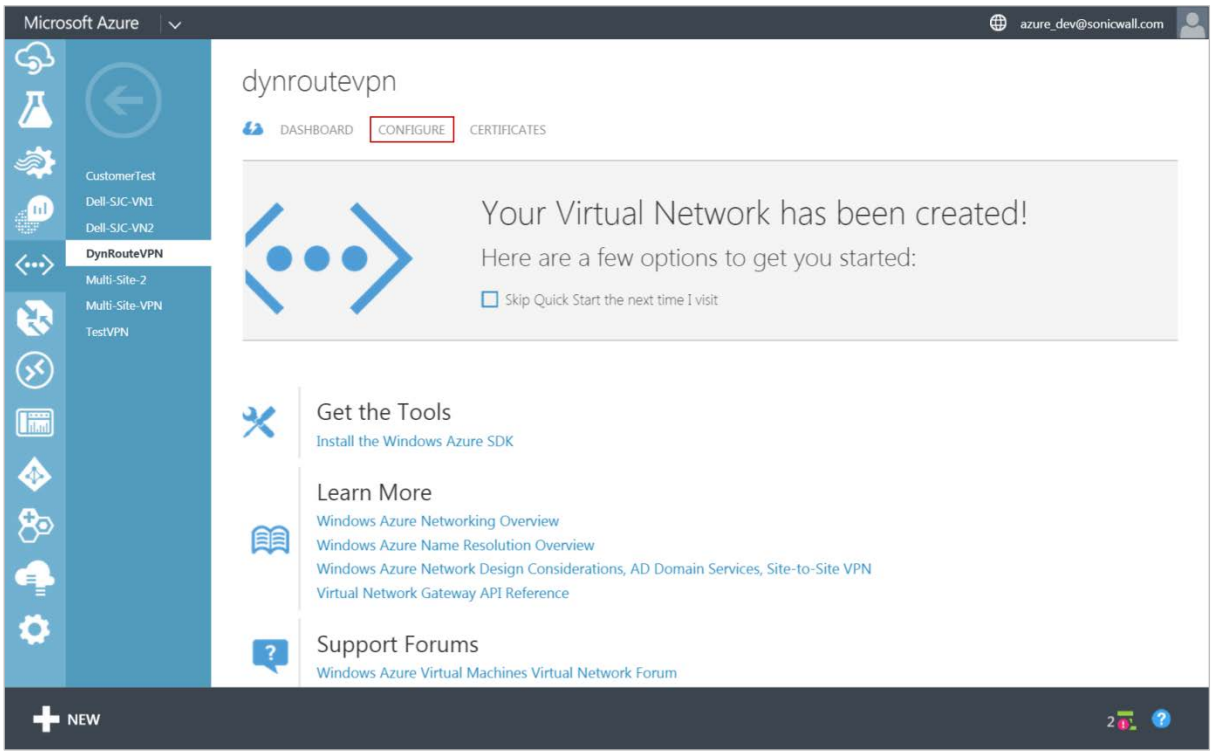
17 Click the **checkmark** to create your network.

After your virtual network is created, the **Management Portal > NETWORKS** dialog displays the **STATUS** as ***Created***.

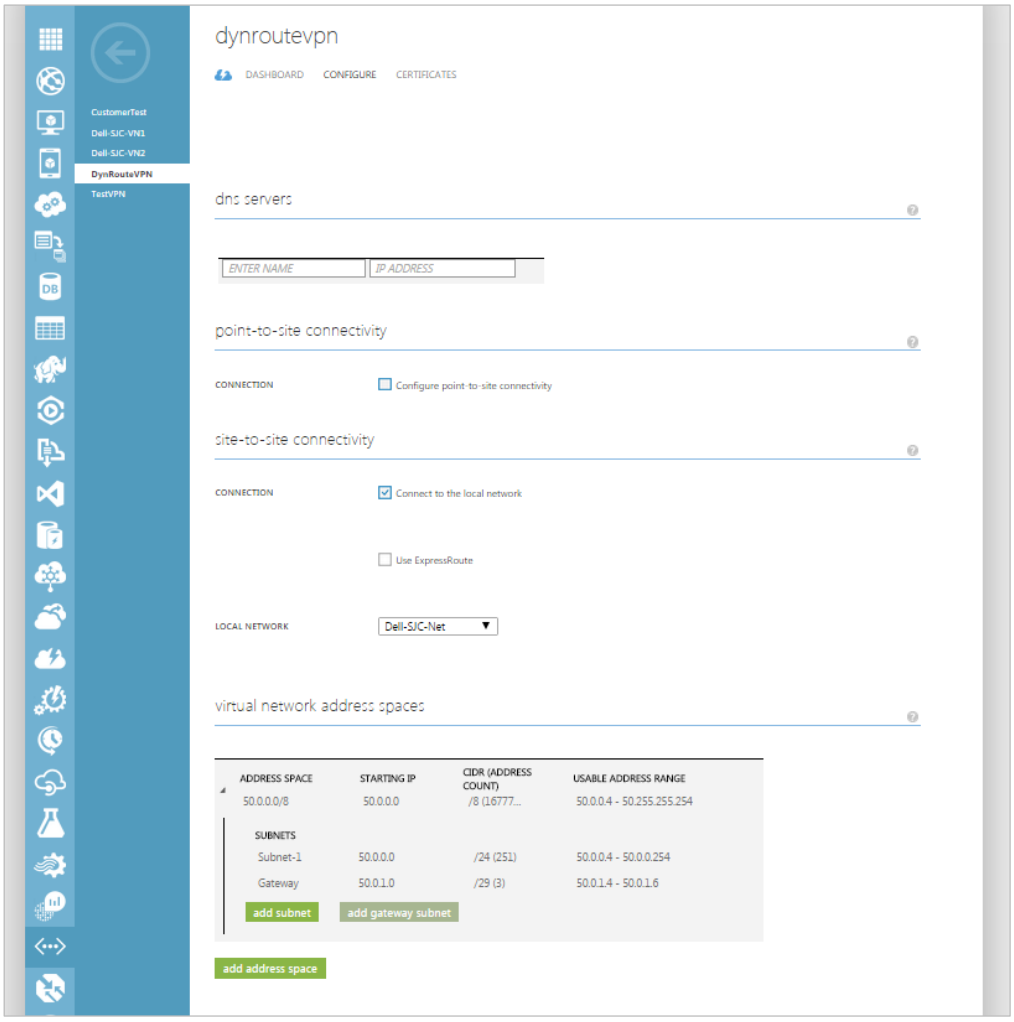


At this point in the configuration, a virtual network is created in the cloud and a remote network is specified (as the on premise network).

18 To view the configuration details, click the name of the virtual network (in this case **DynRoutevpn**) in the **NAME** column.



19 On the **DynRouteVPN Quick Start** dialog, click **CONFIGURE** to view the details. The **DynRouteVPN Configuration** dialog appears.

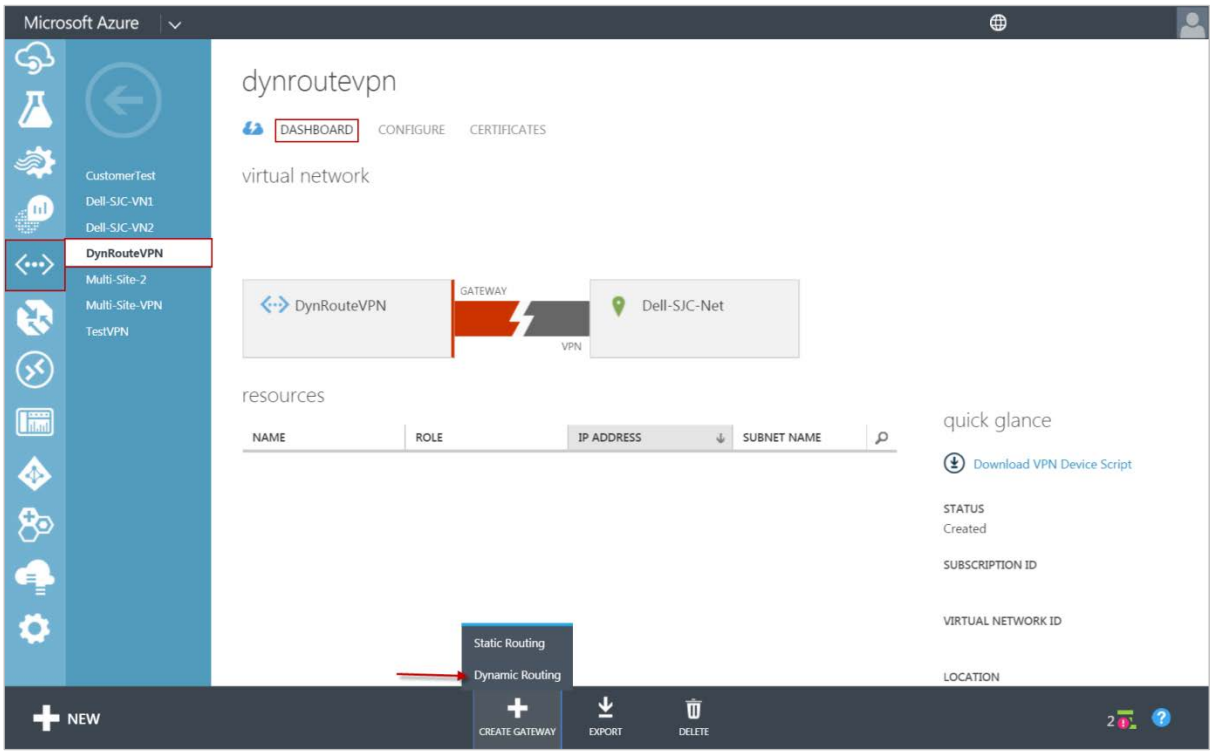


20 Add additional subnets or DNS servers if necessary.

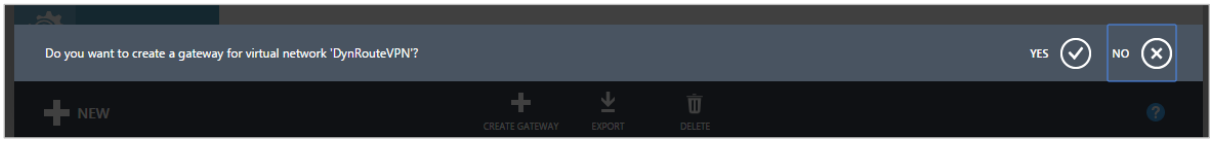
Creating a Virtual Network Gateway

21 On the **DynRouteVPN Quick Start** dialog, click **DASHBOARD**.

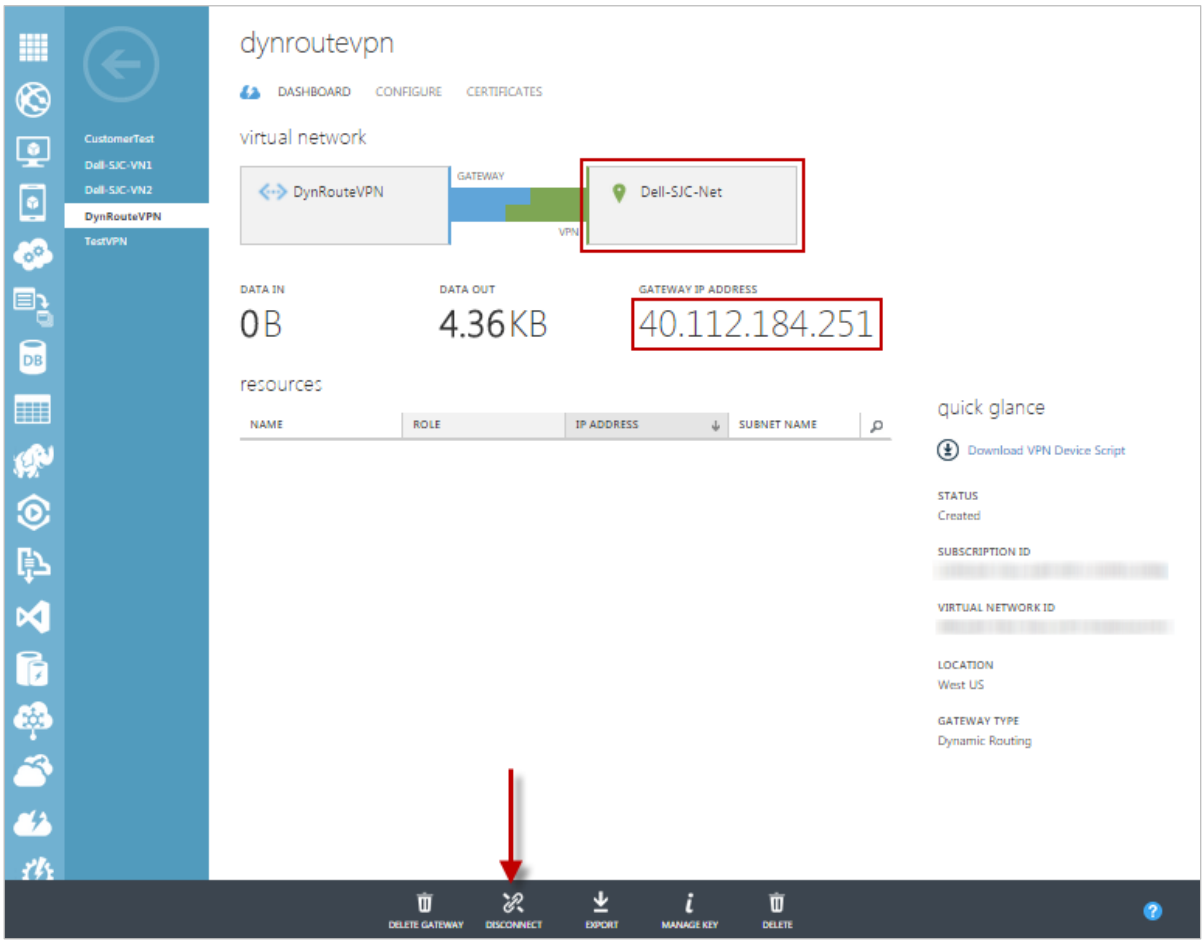
22 At the bottom of the dialog, click **CREATE GATEWAY**, and then select **Dynamic Routing**.



23 When prompted to confirm the gateway creation, click **YES**. Depending on your connection, it could take up to 15 minutes to create the gateway.



The updated **DynRouteVPN Quick Start** dialog displays:



The public facing IPv4 address is not generated until the gateway has been created. After the gateway is created, you should see the public facing IPv4 address of your virtual network under the **GATEWAY IP ADDRESS**. This IP address must be entered under the **IPsec Primary Gateway Name or Address** in the Dell SonicWALL firewall.

NOTE: The **GATEWAY IP ADDRESS** might change if the gateway is deleted and re-created.

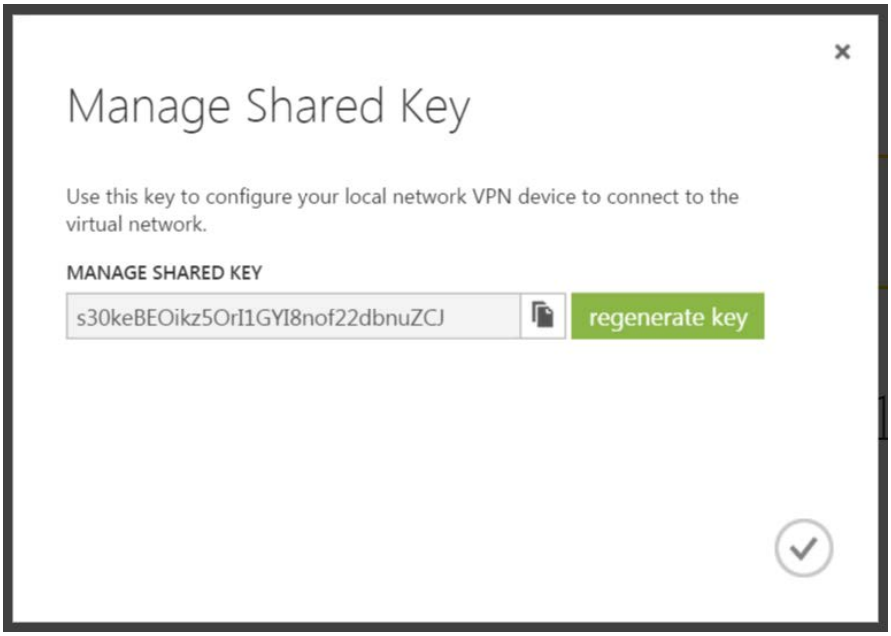
Managing Shared Keys

Use Shared Keys to configure your local network VPN device to connect to the virtual network.

To obtain a Shared Key, complete the following steps:

24 Click **Manage Key** at the bottom of the Azure Dashboard.

A pop-up dialog appears. This dialog includes an auto-generated shared key you can copy to connect the Microsoft Azure gateway and your Dell SonicWALL firewall.



25 Click the **Copy** icon next to the key to copy the shared key.

You can optionally click **regenerate key** should you decide to change the VPN preshared secret in the future.

CAUTION: If you regenerate the key after using it to connect the firewall and the virtual network, the virtual network loses connectivity with the local network until you reconfigure the firewall with the new key.

SonicOS Configuration Tasks

Complete the following in the SonicOS management interface of your Dell SonicWALL appliance:

- Creating a Tunnel Interface VPN
- Creating an Address Object for the Virtual Network
- Creating a Static Route Policy

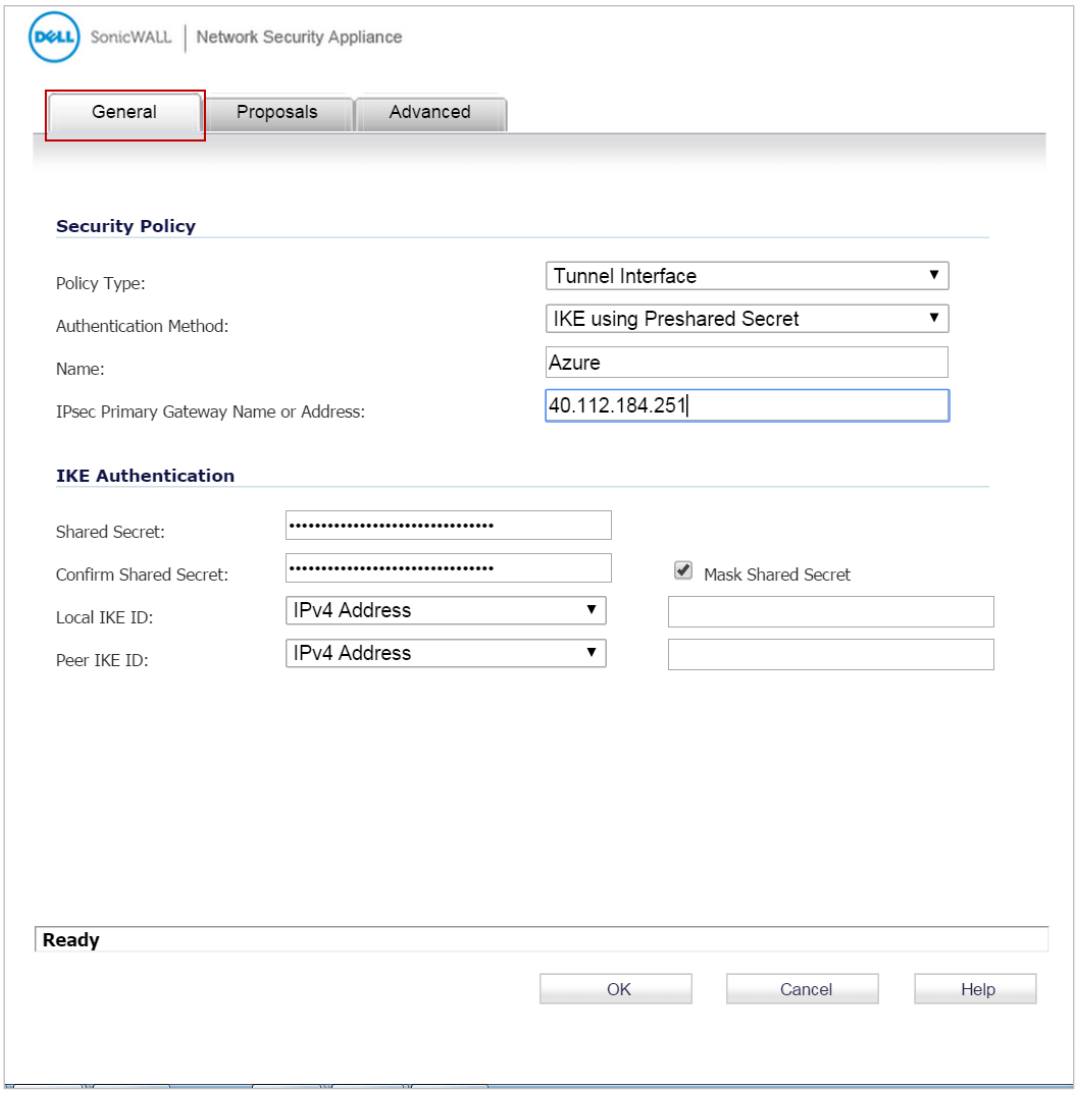
Creating a Tunnel Interface VPN

1 Log in to the SonicOS management interface as an administrator.

2 Navigate to the **VPN > Settings** dialog.

3 Click **Add**.

The **VPN Policy** dialog displays:



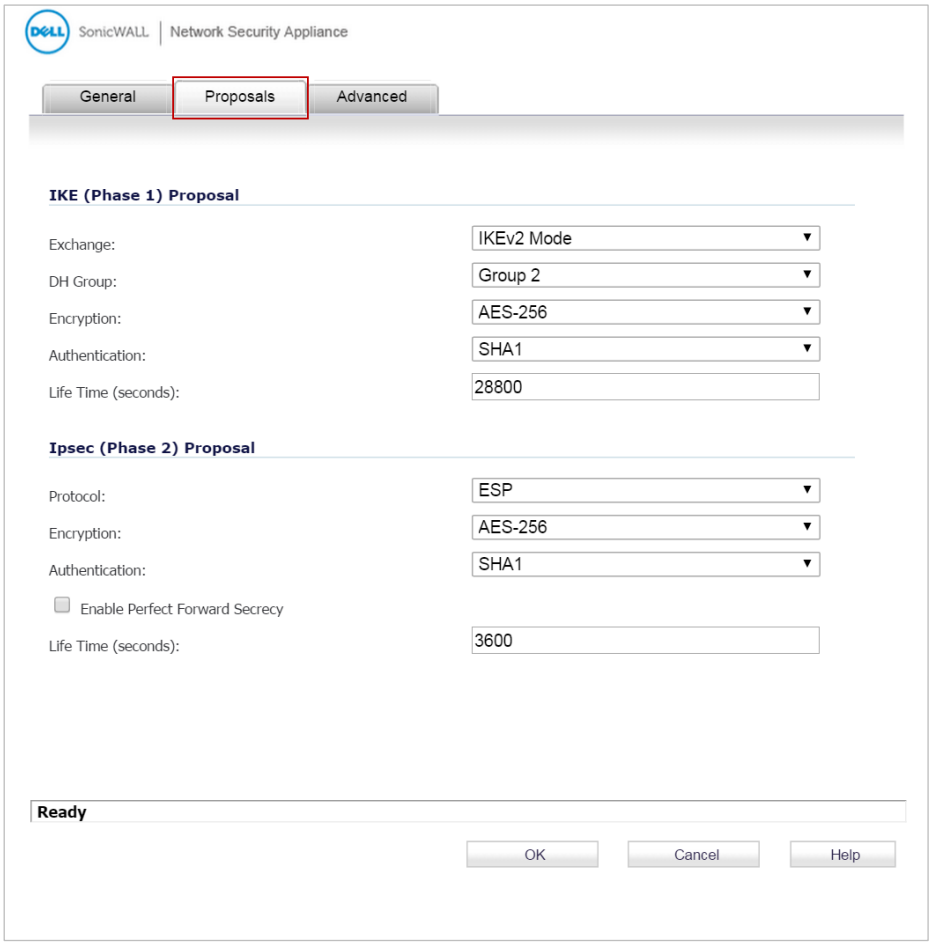
4 Enter the following information:

- **Policy Type** – Select **Tunnel Interface** from the drop-down menu.
- **Authentication Method** – select **IKE using Preshared Secret**.
- **Name** – Enter a name for the policy (***Azure*** is used in this example).
- **IPsec Primary Gateway Name or Address** – Enter the **GATEWAY IP ADDRESS** displayed on the **Virtual Network TestVPN Dashboard** dialog of the Azure Management Portal. For more information, see the DynRouteVPN Quick Start dialog.
- **Shared Secret** – This is auto-generated by Azure. Copy it from the Azure Virtual Network dashboard, under **Manage Key**, and then enter it into this field. For more information, see Managing Shared Keys.

5 Click the **Proposals** tab.

6 Click the **Exchange** drop-down menu, and then select **IKEv2 Mode**.

Azure supports only IKEv2 Mode for route-based site-to-site VPN. For more information about the settings on this dialog, refer to this MSN article titled About VPN Devices for Virtual Network.

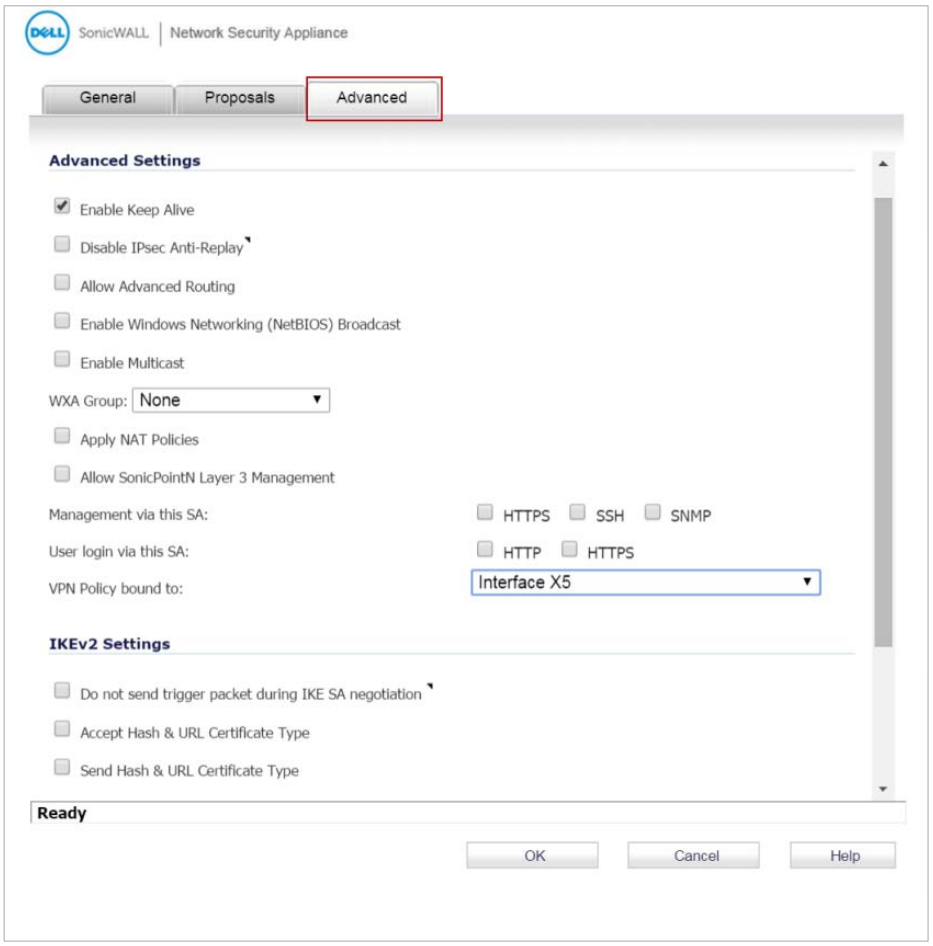


7 Click the **Advanced** tab.

8 Enable Keep Alive by checking **Enable Keep Alive**.

9 Click the **VPN Policy bound to** drop-down menu, and then select a WAN interface. For example, ***Interface X5***.

10 Click **OK**.



11 Select **Enable Keep Alive** to use heartbeat messages between peers on this VPN tunnel. If one end of the tunnel fails, using Keepalives allows for the automatic renegotiation of the tunnel without having to wait for the proposed Life Time to expire.

12 Click the **VPN Policy bound to** drop-down menu, and then select the appropriate interface (the WAN interface on the Dell SonicWALL firewall). For example: Interface X1.

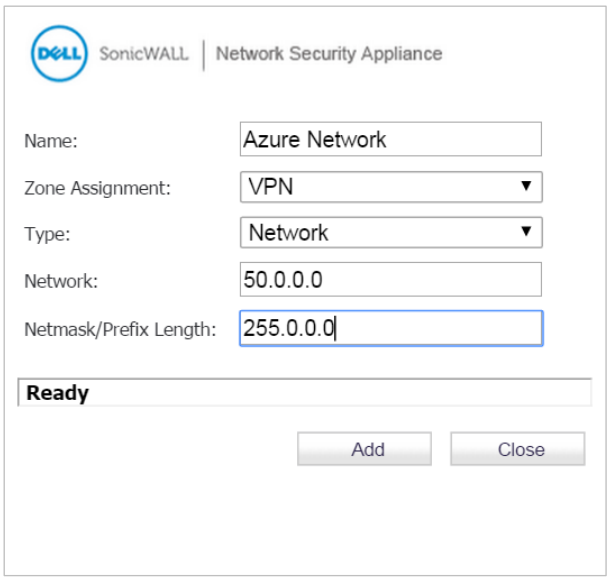
13 Click **OK**.

Creating an Address Object for the Virtual Network

14 Navigate to the **Network > Address Objects** dialog.

15 Click **Add** to create a new Address Object.

The **Add Address Object** dialog displays:



NOTE: The information displayed in this dialog is for example only, and can vary depending on your network.

16 Enter the following information:

- **Name** – Enter a name for the Address Object (***Azure Network*** is used in this example)
- **Zone Assignment** – Click the drop-down, and then select **VPN**.
- **Type** – Click the drop-down, and then select **Network**.
- **Network** – Enter the network IP address as shown in the Configuring a Virtual Network Address section.
- **Netmask/Prefix Length** – Enter the netmask.

17 Click **Add**.

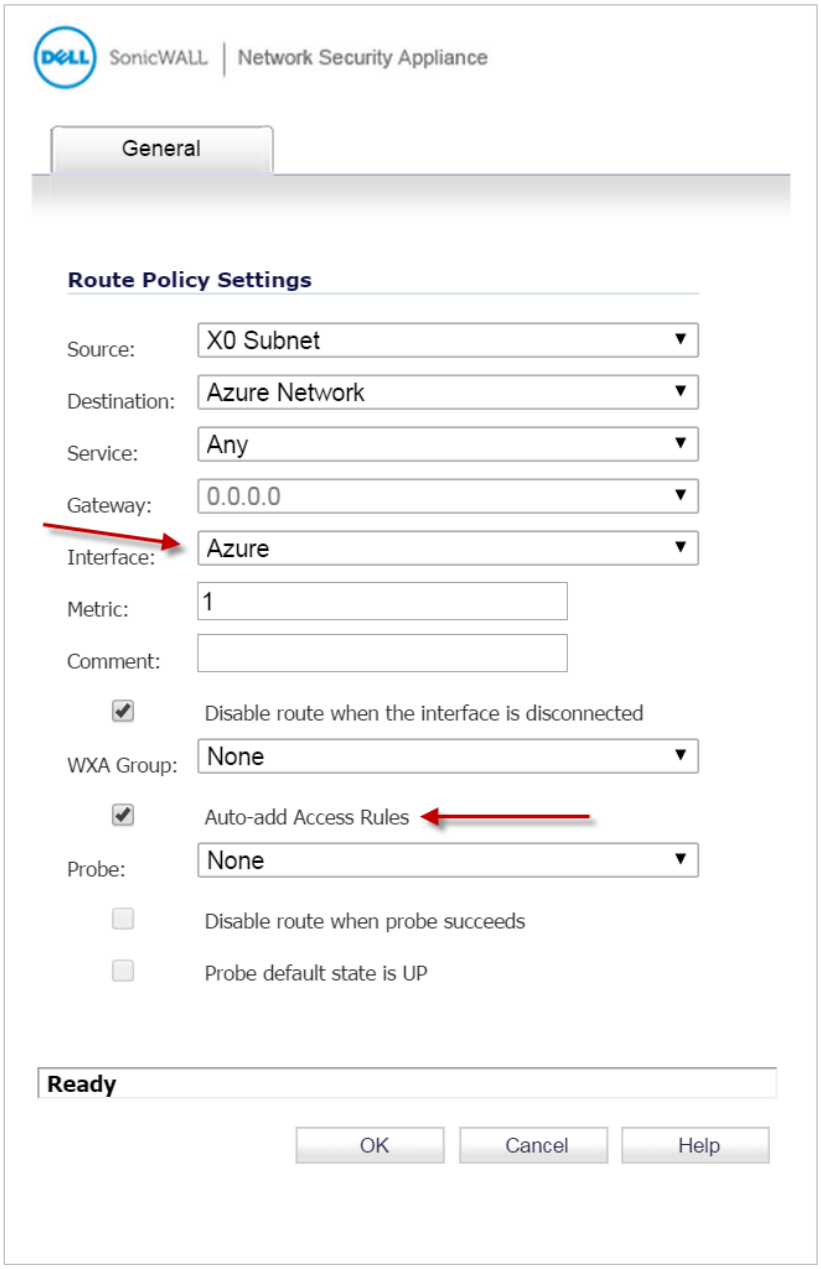
Creating a Static Route Policy

To create a static route policy, complete the following steps:

18 Navigate to the **Network > Routing** dialog.

19 Click **Add** to create a new Route Policy.

The **Add Route Policy** dialog displays:



20 Configure **Source** to the same on-premise network you configured in the Site-to-Site Connectivity dialog.

> **NOTE:** The information displayed in this screenshot is for example only, and could vary depending on your network.

21 Select **Disable route when the interface is disconnected**.

22 Select **Auto-add Access Rules**.

23 Click **OK**.

Testing the Connectivity

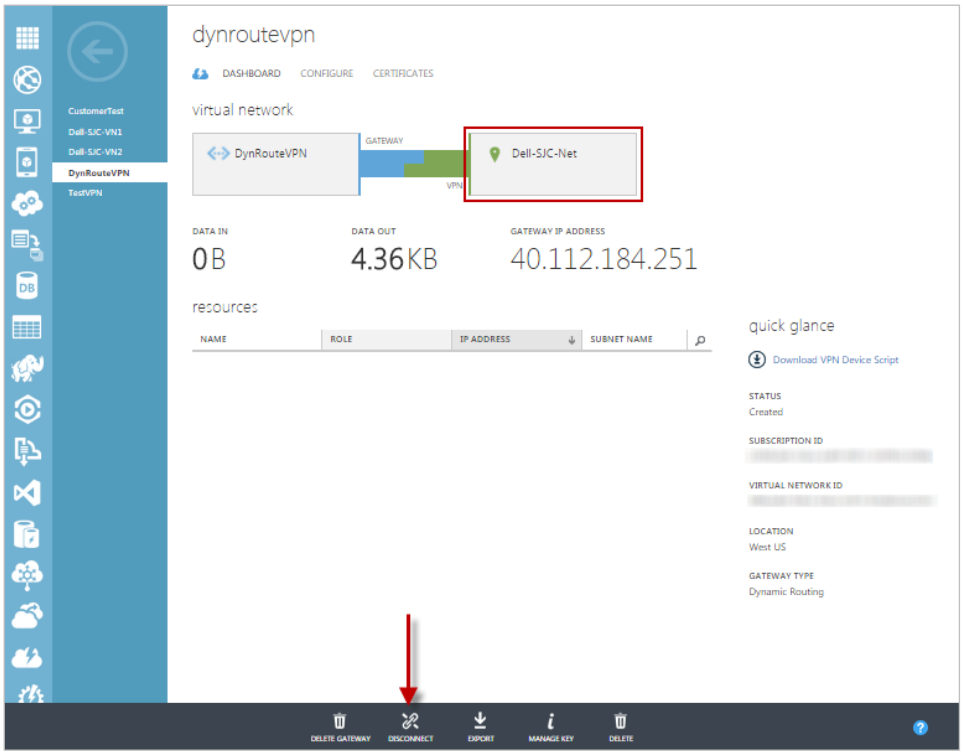
With the configurations completed on both sides, you can now initiate the VPN connection.

To test the connectivity from Azure:

1 Go to the Azure Management Portal, navigate to **NETWORKS**, and then click on your virtual network to go to its **Dashboard** dialog.

2 Because you enabled **Keep Alive**, the tunnel should be up at this stage. If not, click **CONNECT** to initiate the tunnel set up from the Azure gateway.

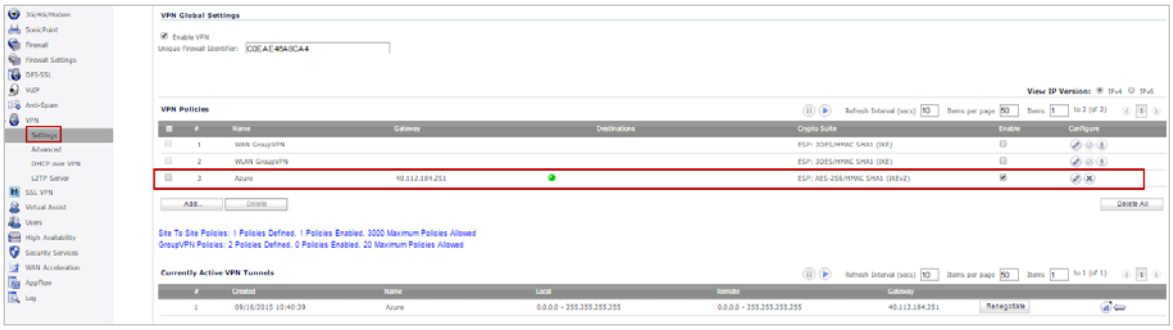
After a brief wait, the VPN tunnel shows as connected in the Azure Management Portal. After the tunnel is established, the portal appears as follows:



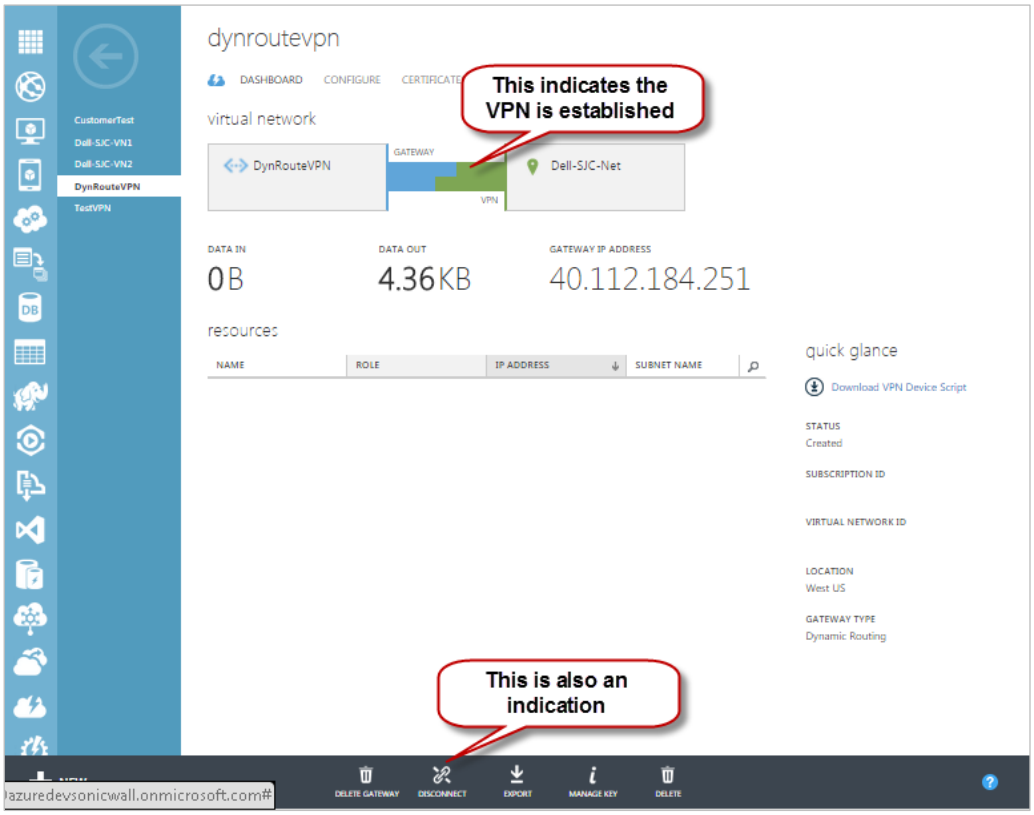
To test the connectivity from SonicOS:

1 Log in to the SonicOS management interface, and navigate to the **VPN > Settings** dialog.

In the VPN Policies table, the VPN shows as connected:



It might take a while for the VPN tunnel to show as connected in the Azure Management Portal. After the tunnel is established, the portal appears like this:



2 To test traffic flow from the SonicOS side to the Azure cloud, complete either of the following:

- Try to establish an RDP connection to a Virtual Machine (VM) in the cloud on port 3389 from a host behind the Dell SonicWALL firewall.
- Try to ping a VM in the cloud from a host behind the Dell SonicWALL firewall.

NOTE: By default, a VM in the Azure cloud has the inbound ICMP blocked by Windows Firewall and needs to be enabled in Windows using this command: *`netsh advfirewall firewall add rule name="All ICMP V4" protocol=icmpv4:any,any dir=in action=allow`*

Legend

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.

IMPORTANT NOTE, **NOTE**, **TIP**, **MOBILE**, or **VIDEO:** An information icon indicates supporting information.

Last updated: 11/5/2015

232-002268-00 Rev C